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THE GOLD FIELDS
OF
NOVA SCOTIA

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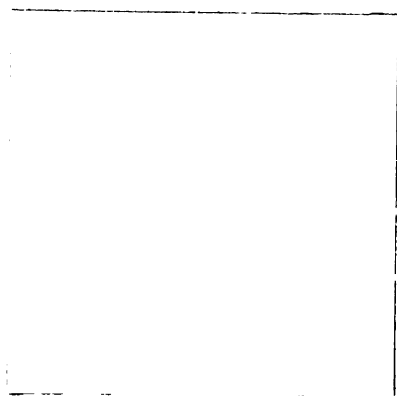
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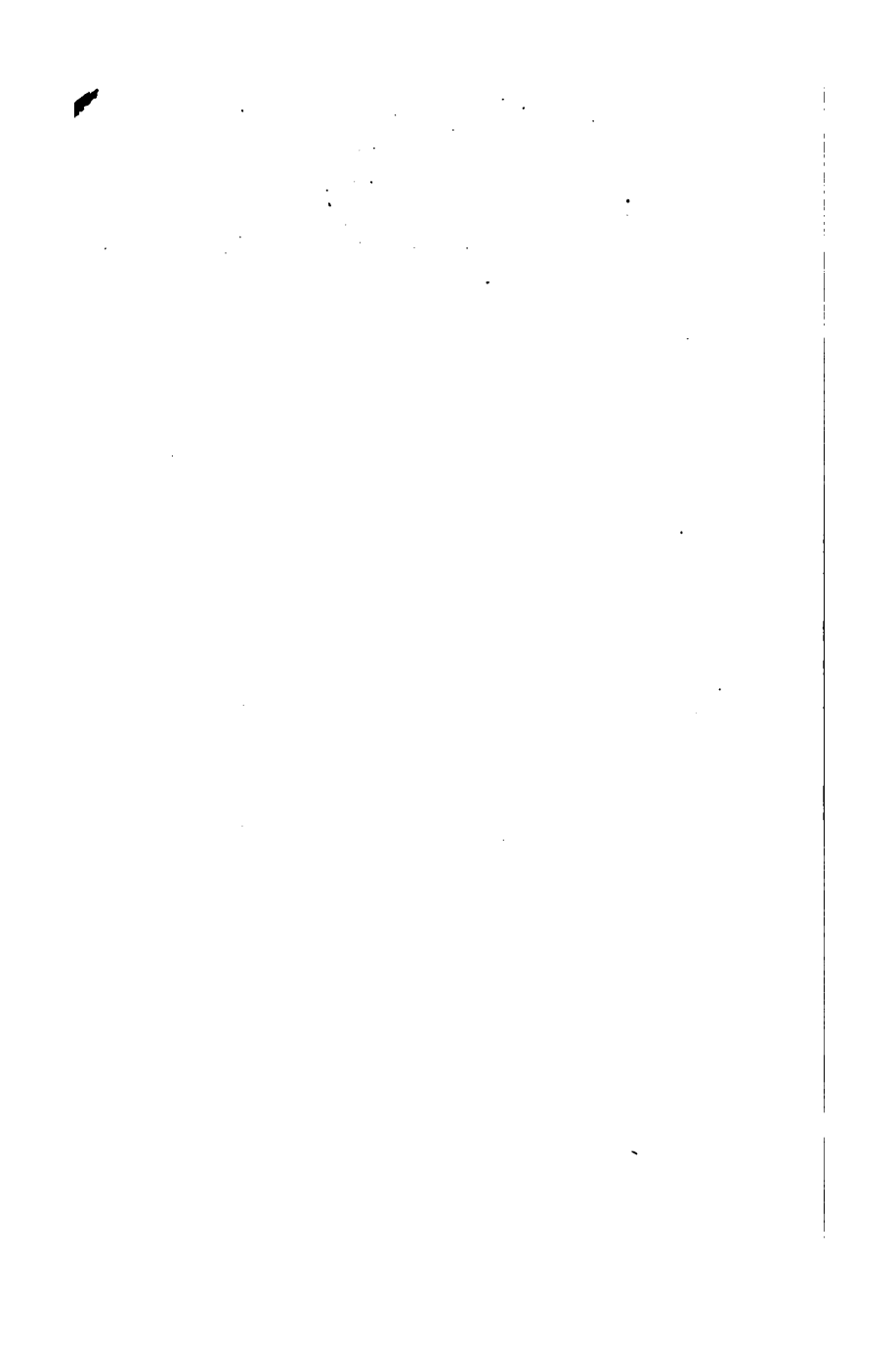


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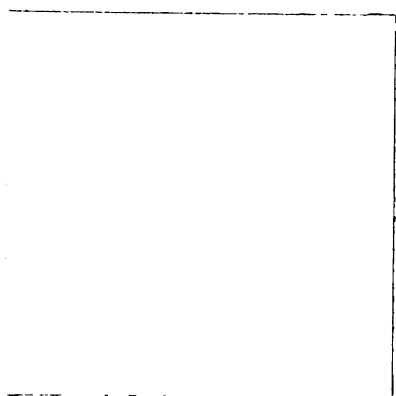






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IMPORTANT TO ALL PERSONS INTERESTED IN THE DEVELOP-
MENT OF THE MINERAL RESOURCES OF NOVA SCOTIA.

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*On the Second Friday of each month, beginning with the 10th January,  
1868, will be published*

## THE MINING GAZETTE,

which, although chiefly to be devoted to the mining interests of this Province, will also contain a repertory of mining intelligence from all parts of the world, and a notice of every invention or discovery that might be useful to the investor, the miner, the amalgamator, and the explorer. Its columns, likewise, will always be open to practical suggestions and reports from correspondents.

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A. HEATHERINGTON,

*Sole Proprietor.*

Halifax, N.S., 21st Nov., 1867.

(UNDER OFFICIAL PATRONAGE.)

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*J. C. Brannese*

# A PRACTICAL GUIDE

FOR

~~Quarries Miners and Inspectors~~



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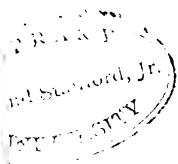
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IMPORTANT TO ALL PERSONS INTERESTED IN THE DEVELOP-  
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Halifax, N.S., 21st Nov., 1867.

(UNDER OFFICIAL PATRONAGE.)

Bat
J. C. Brannese
A PRACTICAL GUIDE

FOR

Tourists, Miners, and Investors,

AND ALL PERSONS INTERESTED IN THE DEVELOPMENT OF THE

GOLD FIELDS OF NOVA SCOTIA.

BY

A. HEATHERINGTON,

*Author of Cosmopolite's Statistical Chart and Tetraglot Reviews, adopted
by the Department of Mines and the Paris Exhibition Committee,
&c., &c.*

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GUIDE

TO THE

GOLD FIELDS OF NOVA SCOTIA.

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GUIDE

TO THE

GOLD FIELDS OF NOVA SCOTIA.

CHAPTER I.

OUTLINE OF THE HISTORY OF NOVA SCOTIA.

The discovery of this portion of America is usually attributed to Sebastian Cabot, a Portuguese mariner, who sailed from Bristol, England, under a commission from Henry the Seventh, and landed here about June, in the year 1497; but if the traditions of Iceland may be credited, the navigators of that country frequented these shores early in the eleventh century.

From the date of Cabot's re-discovery, assuming that the Icelanders really knew of Nova Scotia's existence, the coast was used as a common fishing ground by the French, Portuguese, Spanish, and English, until 1604, when the then king of France, Henry the Fourth, acting upon the advice of the Jesuits, sent out an expedition under Admiral de Monts, to take possession of and colonize the country, which, in the royal warrant appointing De Monts governor-general, is styled Acadie.

It is rather singular that the first place of settlement

selected by the French should have been on the extreme west coast, Annapolis Basin—by them called Port Royal,—when so many good harbors were to be met with nearer east. They founded Port Royal in 1605 and remained in quiet possession until 1613, when a British filibuster, Captain Argyle or Argall, from Virginia, made a raid upon their different homesteads along the coast, burned their ships, pillaged their property, and sent the unfortunate settlers back to their own country. The French government does not appear to have resented this high-handed outrage, nor did the fate of the returned colonists prevent fresh departures for Acadia.

But the ownership, as well as the name of the country, remained an open question; for, under date of the 10th September, 1621, Charles the First of England made a grant of the whole Province, including New Brunswick, the Island of St. John (now Prince Edward's,) and Cape Breton to Sir William Alexander, calling the same, in compliment perhaps to its new lessee, Nova Scotia, a name it has ever since retained in English history.

The same sovereign shortly afterward instituted the order of Baronets of Nova Scotia, the title to be conferred upon persons who should assist the colonization of the province at their own expense; and in 1627 a large expedition under the new proprietor sailed to take possession; but either dissatisfied with their bargain, or unwilling, because unable, to dispossess previous settlers, they only remained a very short time.

Eleven years after the issue of Sir William Alexander's charter, the province was again formally ceded to France. The neighboring British States, perhaps encouraged by the home government, were unwilling to tolerate the French

as colonists, and whenever a new settlement was founded or began to flourish, marauding parties of British were sure to invade it and drive the industrious Frenchman from his home. Port Royal (Annapolis), the stronghold of the French, seems to have been the especial object of dislike, and in 1710, for the fifth time, was wrested from its lawful owners. By the subsequent treaty of peace, in 1713, Nova Scotia proper was returned to the English, while all French residents were compelled to take the oath of allegiance to Great Britain, or quit the country. France still retained the island now called Prince Edward's, and the eastern extremity of the peninsula where she founded and fortified the town of Louisburg.

A fresh war breaking out between England and France in 1744, an expedition was equipped the following year in the New England colonies under the command of Sir William Pepperall (ominous name!) which surprised and captured Louisburg and took possession of the rest of Cape Breton: but the aboriginal tribes were so friendly to the French that the usurpers made no progress at colonization and found their new acquisition only a source of trouble.

Two years later an armament was fitted out by France under the Duke d'Anville to recapture the French possessions in the province, but the expedition was delayed through contrary winds; many of the vessels were lost at sea, and the crews of those which arrived were decimated by scurvy. The disease was communicated to the Indians, nearly one-half of whom died from its ravages. An attempt was made to retake Annapolis, but, being defeated, the Duke d'Anville and the Comte d'Estourville, his second in command, were so disheartened that they committed suicide, and their

few adherents who had survived battle, sickness and shipwreck, returned home.

The following year (1747) Cape Breton was once more ceded to France. Seven years afterward, war being renewed, the governor of Nova Scotia seized upon and transported the remaining French inhabitants who did not escape to Prince Edward Island and New Brunswick, or die from exposure and privation in their flight from his vengeance.

In 1758 the whole of Cape Breton and Prince Edward's Island was surrendered to England. The white population at that period did not exceed six thousand souls, but in 1764 settlers began to arrive from the New England States and Ireland, and since then their number has gradually increased, and is now estimated at three hundred thousand.

Nova Scotia, it will thus be seen, was for more than one hundred years after Cabot's landing, a mere fishing station, and for the next hundred and fifty, the scene of constant raids and warfare. The only claim that the British appear to have had to the soil was their priority of discovery; but not having availed themselves of it, the right of the French was greater on account of their efforts of colonization. Although ousted from the territory six different times, and constantly molested, they retained a foothold upon it for a century and a half; but the memory of the old Acadian *émigré* and the glories of Port Royal survive only in Micmac traditions, and in the beautiful legend of Evangeline.

CHAPTER II.

A COSMOPOLITE'S SKETCH OF HALIFAX AND SOME OF ITS INSTITUTIONS.

The Indian name of Halifax and the bay in which it lies, was Chebucto; that which it now bears was given to it in compliment to George Savile, Viscount Halifax, a statesman who had been very popular in the reign of Charles the Second.

The town was founded in 1749 by Lord Cornwallis, after whom one of the best streets of the north end is still called.

Approached directly from the sea by a safe and spacious channel, and built upon a sloping peninsular eminence, the site could not have been better chosen, and when the numerous dirty, unpainted, and irregular shanties which now disfigure it, shall have given place to clean and commodious edifices, the aspect of Halifax from the harbor will be one of real magnificence.

The streets are nearly all built at right angles to each other. The town is in the shape of a pear, the stem end pointing almost due south. It is four miles long by two and a-half broad. The streets having the best appearance are Granville, Hollis, and Pleasant. The old Provincial Buildings, containing the Mines Department offices, is entered from the first; the new House of Assembly from the second, and the Governor's residence from the last. These streets are paved with brick or stone nearly their whole length; the remainder have only a gravel sidewalk.

Water street, like its namesakes in other cities, has the largest portion of dirt and traffic. The drains, probably on account of the cost of cutting through the rocky ground, are only from eighteen inches to three feet in depth, a fact of which one is unpleasantly reminded in dry warm weather on passing near the open gratings.

The gas lamps are either a greater distance apart than in most other cities, or the gas is very poor, though it costs three dollars per thousand feet. The lamps are generally so dirty that the light reflected from them merely serves to make darkness visible. When the moon is on the increase the gas is not lit at all, an awkward regulation for persons who are about at nights when Dame Luna capriciously hides herself from view.

The houses are chiefly built of wood, and some of the older ones are not much better than wigwams. Large cheerful windows are almost unknown at the north end; at the south end a few houses with modern improvements have recently been constructed. There are no dust bins in the yards, and rubbish is gathered up in a heap under the back parlour window for the winter, and in summer it is put into boxes or barrels in front of the house until cleared away by the wind, or the city scavenger.

A new ordinance directs that in future all buildings raised within city limits shall have a brick or stone foundation, and considering that there are good clay fields, and granite and freestone quarries within thirty miles of Halifax, it is a wonder that those materials have not been more generally used.

Parks, squares, or ornamental grounds for recreation, there are none. At the south end of the city on Point Pleasant, a wooded tract of land bounded on the east by the

harbour, and on the west by the north-west arm, and now occupied by a military fort, has been granted by the Imperial government for the nominal rental of one shilling, for conversion into a park. The location is excellent, and with taste might be made a very handsome retreat.

There is a horticultural garden, too, of small dimensions, in Spring Garden Road, to which admission is obtained by payment of sixpence sterling. The military and naval bands perform there at times, but it contains nothing to make it otherwise permanently attractive.

West of the town, extending north and south, is a large field known as "The Common," surrounded by small spruce trees, enclosed within wooden white painted fences, which look at a distance just like tombstones. It contains no shaded avenues, fountains or parterres, and but very few seats, and the paths across it are without lamps. Much of the ground is swampy, and although mostly used for cricket and drill exercise, it seems, too, a kind of *morgue* for cats, dogs, and hoop-skirts.

From the top of Citadel Hill, about two hundred and fifty feet above the sea level, a splendid panorama is presented to the view, including the whole of the city, harbor, Dartmouth, and over twenty miles of the surrounding country. Three or four years ago the path round the moat was a favourite promenade, but since the threatened Fenian invasion, the commandant has ordered the public to be excluded.

There are not half a dozen private gardens in the town worth visiting, the majority being shabby and neglected.

Halifax contains four cemeteries, the Old English, the Camp Hill, the Catholic, and the Naval. The Old English, situated at the corner of Granville Street and Spring Gar-

den Road, contains some fine monuments, but generally speaking, the tombstones and enclosures in each graveyard require repairs or painting. Few chiselled inscriptions are legible, the letters not being filled in with color. If a distinction can be made, the Catholic cemetery is kept in better order than the rest.

The buildings of probable attraction to the stranger are the Governor's residence, the Provincial Building, the new House of Assembly, the Court House, the City Hall, Dalhousie College, and the different city banks. Among the latter should be included the establishment of Messrs. Huse and Lowell, 61 Upper Water Street, where the monthly productions of the gold mines, in the shape of ingots, is exhibited before shipment to Boston.

The genealogist will be interested to learn that lineal descendants of the reputed discoverer of the country are residing in Halifax, and that the name can be seen over a shop front in Granville Street.

The so-called market-house is not capable of accommodating more than forty persons, and the dealers in country produce, who cannot secure inside shelter, have to take their stand outside the building, where they are often exposed to the broiling sun or the inclemency of the weather for hours together, and their baskets and carts obstruct and render unsightly the entrance to the House of Assembly.

The principal hotels are, the Halifax, the International, Carlton House, Waverley House, the Mansion House, and Miss Lovitt's. In luxury of fittings and table they are all excelled by any second rate hotel in the United States, and in positive comfort by many a country inn in England. The day charge varies from a dollar-and-a-quarter to two

dollars for transient boarders. As quiet family hotels the Waverley, Carlton, and Miss Lovitt's have the preference.

The vehicles in use are a kind of droshky, two-horse carriages, omnibuses, and street cars. The legal fare by the former is sixpence sterling per mile, between eight o'clock A.M. and six o'clock, P.M.; at other hours double that amount; but cabby's own tariff by night or day is the legal fare, and as much more as he can get. The men who ply at the railway station have a practice of filling up each seat before they start, and a stranger to this arrangement may find that, after having engaged a cab for himself, he will be left a quarter of an hour or longer in front of the station, while Jehu is touting on the platform for more customers. He will then be driven half round the city, to accommodate the other passengers, before being deposited at his hotel, and yet charged double as much as he ought to pay for the exclusive use of the vehicle.

The omnibuses are dirty and often over-crowded both with passengers and luggage.

The most comfortable, and consequently the most popular conveyance is the street railroad car, introduced by an enterprising American company in 1865. The ground was first cut in October, 1865, and a double track of narrow gauge rails laid and ready for traffic by the 1st of May, 1866. The distance run is from the railway station, north, to Point Pleasant, south. The tram cost fifteen thousand dollars per mile, and in horses, buildings, and appurtenances the company have invested two hundred and fifty thousand dollars. The fare is only seven cents for the whole course of three-and-a-half miles. Much opposition was manifested against the enterprise by interested parties, but all the harm

they have succeeded in doing was to stop the cars from running on Sunday.

The railway station for the steam-cars is at Richmond, a northern suburb of Halifax. It is rivalled in appearance and accommodation by that of the horse railroad company. The approach to it is insufficiently lighted and sheltered; there appear to be no regulations for stationing the cabs, and on the arrival of the trains the drivers desert their vehicles and throng the doors and platform. The cars are built in the United States, and after the commodious American pattern. The fare is moderate, and the speed is moderate too, as it averages about seven miles an hour.

On the Water Street route to the railway depot, one passes a high wall, more than a quarter of a mile in length, enclosing the Royal Naval Yard, an institution particularly recommended to the notice of Mr. Seely, M. P. for Lincoln, England, who has endeavored to reform some of the abuses which had crept into the Home yards. Here are a few facts, concerning this one, submitted for his information and guidance, to borrow the stereotyped official phrase.

The late storekeeper,—the controlling officer,—after contracting debts to the amount of fifteen hundred pounds or more, was granted seventeen months' leave of absence, and then a liberal pension, no reserve whatever being made by the department for his unfortunate creditors, who were all tradesmen serving the dockyard.

The first and only foreman of works, emulating the example of his superior officer, on a smaller scale, left the country clandestinely, and swindled his creditors by a fraudulent bill of sale in which he unauthorisedly introduced another person's name, who knew nothing of the transac-

tion or the extent of his involvements. Yet he, too, was kept on pay three months after his absconding had become known, and also granted a free passage for his wife and children.

The present storekeeper, who enjoys a liberal salary, with a large house and garden, rent free, and many perquisites, employs a gardener and servant whose wages are charged to the public, although the regulations against officers employing men for their own private benefit are very strict and explicit. A novel system of accountancy calls for comment, namely: Nearly all the building materials used on new works have to be purchased here, and cost from two to five-fold more than they do in England and were accordingly invoiced in the returns rendered previous to this storekeeper arrival; but he, on assuming charge, directed that the established English prices only—no matter what the cost—should be adopted, and the result is that the accounts for repairs and maintenance of buildings, during his regime, have been several hundred pounds undercharged.

There are other matters deserving exposure, but foreign to the present work. The facts here dwelt upon are not gleaned from hearsay but from personal observation, and the author, more than anybody else, has earned the right to be censorious, having himself suffered through official indolence, blundering and incapacity.

The General Post-Office is situated in the western wing of Dalhousie College. A dirty, dingy, narrow passage is the only space reserved for the public. The windows in front of the private boxes are usually so smoked and dusty that it is difficult to recognize the contents of one's box. There are no separate drops for letters to different countries; no

tariff boards, and no unclaimed letter lists, but only cobwebs hanging up in the hall. The clerks on duty are in a room where they can neither see nor easily hear the knocking of applicants for stamps or information; the whole interior is untidy and unclean, and the miscarriage and detention of mail matter are of much too frequent occurrence. A portion of the new House of Assembly has been set apart for a Post-Office, and it is to be hoped that in their fresh quarters cleanliness, correctness and despatch will be the order of the day.

The postal system in itself is extremely liberal. Newspapers and educational pamphlets pass free; the office is opened from four o'clock A.M. until half past nine P.M.; and the rent of a private box is too low for the privileges which the possession of one is supposed to confer. By increasing the rent and the number of boxes a fund might be raised that would enable the authorities to enlarge their staff, and reward the sorters and clerks against whom, at the end of the year, no mistake had been recorded.

The secular press of Halifax is represented by ONE daily '*The Morning Chronicle*,' eight tri-weekly and five weekly newspapers, all sold at two cents a copy. The religious papers, which are tainted with politics too, appear once a week.

In nearly every street one notices a dry goods store, a druggist's and a grocery. The windows of the smaller groceries present an extraordinary spectacle; oranges, knitted-woollen socks, candy, eggs, onions, spools of cotton, boots, butter, corn-brooms, cheese, pickled fish, cheap ballads, and hams, all in one seemingly chaotic heap.

There is a capital opening here for a good engraver and lithographer, neither profession being properly represented.

The enterprises sustained by citizens of the United States are :

- 1st. The Gold and Coal Mines.
- 2nd. The City Horse Railroad.
- 3rd. The lines of Telegraph.
- 4th. The Packet and Steamboat line hence to Boston.
- 5th. The building of the Street and Railway Cars.
- 6th. The engraving of Bank Notes and Postage Stamps.
- 7th. The publication of the Dominion, Province, County, and City Maps, by Church & Co.
- 8th. The manufacture of Quartz Crushers, by Montgomery & Co.

Considering that Halifax is both a military and a naval station it is a very orderly town. Crimes of violence are almost unknown, and house robberies and thefts from the person are of rare occurrence.

The business men and officials of the metropolis are generally obliging, but activity and punctuality rank not among their cardinal virtues. As an American friend who has had some experience of the national character often remarks "A thousand years is as one day, with them ; and one day as a thousand years."

This horrid indifference to the value of time is one cause of Halifax not having kept pace with other cities of the same age on the American continent : the everlasting discussion of politics another.

CHAPTER III.

THE EARLY EXISTENCE OF GOLD IN NOVA SCOTIA.

THE existence of gold in this province was conjectured if not positively known as far back as the time of Queen Elizabeth of England, who, in a patent granted to Sir Humphrey Gilbert on the 11th June, 1578, stipulated for a reservation of one-fifth of all the *gold and silver* that the grantee might find here.

The next reference to the subject is contained in another patent, issued in 1621, by Charles the First to Sir William Alexander, afterwards Earl of Stirling, in which that monarch claims one-tenth of the precious metals which the colony was expected to produce, and in each renewal thereof, in 1625 and 1628, the same claim is repeated.

The French names of *Bras d'or*, *Cap d'or*, and *Jeu d'or*, (now corrupted into Jeddore), strongly confirm the belief that the presence of gold, in those localities especially, was not unknown to the first Acadian settlers. No ancient workings that could positively be recognized as such have yet been discovered, but the author considers that the hollows in the beach which give its name to the Ovens Gold District, are really artificial mines, and not, as generally supposed, natural cavities simply worn by the action of the sea. Nor is there any record of gold having been found, or even any search for it having been made in those districts on account of their suggestive names until the universal excitement through discoveries in California, and subsequently in Australia, resulted in general explorations

and the recognition of this country by geologists as one that might be auriferous.

Sir Charles Lyell in his *Notes on the Geology of North America*, published in 1842, anticipates the discovery of gold in Nova Scotia; Professor Gesner in a work written in 1855, considers the existence probable; and Sir Roderick Murchison in his "*Siluria*" describes the formations in which it was eventually found.

CHAPTER IV.

ACCIDENTAL DISCOVERIES UNATTENDED WITH RESULTS.

CAPTAIN William Pye, Deputy Gold Commissioner for Sherbrooke, and Captain Taylor, holding a similar office at Isaac's Harbor, affirm that, over thirty years ago, when roads were being built through their respective districts, the laborers noticed a bright yellow metal in the stone, (quartz and slate) which they were breaking, but remembering the adage: "All that glitters is not gold," ridiculed the idea of the 'yellow stuff' being valuable, and used to 'whittle it up,' with their knives when sitting down on the sward to take their meals.

A similar statement with reference to the Owen's district is made by Mr. Dowling, prothonotary for the town of Lunenburg.

Mr. W. Crook, farmer, of Lawrencetown, mentions having found gold in quartz early in 1849 while repairing a mill dam on his own property, and when he showed it to

his father, being told to 'drop his nonsense, go on with his work and pitch the rubbish away.' Eleven years afterwards gold in large quantities was found within a few rods of the same spot, and the district gazetted and profitably worked.

On the authority of Mr. A. Salteri, photographer, whose information regarding the early gold mining history of the Province is particularly valuable and interesting, it is stated that Richard Smith of Maitland, now deceased, had in his possession in May, 1857, a small paper containing scales of gold obtained from a river in the Musquodoboit settlement.

CHAPTER V.

DISCOVERY OF GOLD IN ALLUVIUM, RESULTING FROM SYSTEMATIC SEARCH.

THERE are many claimants to the honor of the first intentional discovery and each one has certain merits which the public, and it is to be hoped the Provincial Government too, will hereafter properly recognize. Even where the finding has been accidental the parties should be entitled to reward, but some signal recompense is deserved where time, energy, intelligence, and capital that could ill be spared, have been specially devoted to the search.

The quantity of gold as yet obtained is not so very large in the aggregate, but in its proportion to the number of men employed in mining, it far exceeds that of any

other country; and as day by day the capabilities of the several districts become known and appreciated, their development will give to this little Province a prominence and wealth which, without the discoveries in question, it never could have been made to attain. It is, therefore, but just that all who have contributed to its prosperity should receive compensation in proportion to the priority and importance of their discoveries.

The first practical results were obtained by Mr. John Campbell, a resident of Dartmouth, who in 1849, through reading the newspaper reports from California, made preparations to go there. Circumstances happened to prevent his departure, and influenced by the descriptions of the California gold fields, conceived the idea of searching for similar geological formations in this, his native country, and during the same year actually succeeded in panning gold from several places along the sea shore.

Mr. Campbell continued his investigations with varied success until 1857, when he obtained the co-operation of Mr. R. G. Fraser, the assayer, who made some experiments on the sands at Fort Lawrence, in Halifax Harbor, from which they obtained a very good show of gold.

Encouraged by these results, Mr. Campbell made a report to the Government, accompanied by specimens and testimonials from persons who had seen other specimens which he had retained, stating his belief that gold would be found here in large quantities. He also made application for a license to prospect and mine on Sable Island, where, judging from samples still in his and Mr. Fraser's possession, the sand is highly auriferous. No action was taken upon that report, and though the prospecting license was accorded, its terms were so illiberal that Mr. Campbell and his

friends had to abandon the project, for which tools, machinery, miners, and a vessel to transport them had already been purchased.

Mr. Campbell's explorations do not appear to have been conducted with a view to discovering gold otherwise than in sand and alluvium ; but to him unquestionably belongs the credit of first having demonstrated its existence through tangible proofs obtained by persistent scientific search.

CHAPTER VI.

FIRST SCIENTIFIC DISCOVERY OF GOLD IN QUARTZ.

THE first authenticated discovery of gold-bearing quartz was made by an officer of the Royal Artillery, Lieutenant (now Captain) C. L'Estrange, while moose hunting in the woods at Tangier, in the autumn of 1858, and as no allusion has been made to this circumstance in any previous report, the reader will be interested in the following letters from Captain L'Estrange and Dr. Cogswell, which the author has received permission to publish.

Dr. Cogswell to Captain L'Estrange.

Halifax, N.S., August 14, 1867.

MY DEAR SIR,—I recollect your shewing me some years ago, one or two specimens of quartz, colored with what you believed to be gold, which you had lately brought from the country.

I submitted them to Mr. * * *, and he told me his opinion was that the color was owing to iron.

At that time the general idea derived from the explorations of geologists was, that gold did not exist in the Province.

I am, dear sir, yours truly,

C. COGSWELL, M.D.

CAPTAIN L'ESTRANGE.

Captain L'Estrange to the Author.

Camp Hill, Halifax, Oct. 22nd, 1867.

DEAR SIR,—In answer to your communication of the 15th inst. I have much pleasure in informing you of my discovery of Gold in this Province in 1858. The circumstances are as follows : During a hunting trip on the Tangier River, in September, 1858, accompanied by the late Mr. Gilbert Elliot of H. M. S. "Indus," attended by three Indians, Noel Louis *alias* Plowitch, Joe Paul and Frank Cope, I found unmistakeable traces of gold in the quartz of that district. I, with great difficulty, having no hammer, procured some specimens shewing a trace of the metal, but was not chemist enough at the time to test them. However, I shewed them to Colonel Nelson, R. E., who said that such traces might be found anywhere, to Dr. Cogswell and others, but was discouraged from prosecuting my discovery by the ridicule of the *savans* in mineralogy. The only exception was Mr. Campbell, who told me that he also had discovered gold even in Halifax Harbor, on the sea-line of the Province. Soon after this, I met with an accident when moose hunting, which prevented my again going to this district, and it was not until my arrival in the Mauritius in 1861, that I saw a newspaper account of the discoveries of gold at Tangier, N. S. I believe that it was the Indians above mentioned that started the search that ultimately led to such golden results.

I well remember some weeks after my return from Tangier, finding a small pearl in my oyster soup at dinner, and being told by one of the *savans* : "It is a more valuable discovery than your gold mine."

I am, dear sir, yours faithfully,

C. L'ESTRANGE,
Captain R. A.

In less than two years after Captain L'Estrange's discovery, a persevering explorer accompanied by one of the Captain's late guides, Joe Paul, struck the same spot, brought specimens of gold-bearing quartz away with him, and so thoroughly convinced the doubting savans of its presence there in continuous veins, that Tangier was proclaimed a gold district, and the gold mining era of the Province practically initiated from that period.

CHAPTER VII.

DISCOVERIES FROM WHICH PRACTICAL BENEFITS HAVE BEEN DERIVED.

The indefatigable explorer alluded to at the close of the last chapter is Mr. John Gerrish Pulsiver, farmer, of Musquodoboit, whose happening upon the spot Captain L'Estrange discovered does not lessen the recognition due to his intelligent researches. In fact, Mr. Pulsiver met with so many rebuffs from savans and so called leading men, as well as ridicule from his neighbors, that it is a wonder he too did not become discouraged. His experiences have been so varied and so thoroughly exemplify the uncertain success attending explorations and discoveries, that we relate them as told to us by himself.

MR. PULSIVER'S STATEMENT :

"What first gave me the notion of looking for gold was, some Indians who had been out hunting along with the

officers reported having come across a belt of curious evergreens in the forest near Musquodoboit. This was in 1848 or 1849, about the time of the gold excitement in California. Some of our young men who had gone out there saw the account of those trees, and wrote back to tell us that they were laurels and only grew upon ground that contained gold; so the next year (1850) Captain McLeod, Edw. Taylor, W. H. Hurry, John Taylor and myself, formed a Mining and Exploring Association, and we engaged Thomas Jones Bulgen, formerly superintendent in Mr. Cunard's slate quarries, for our mining captain; but as he had had no experience in searching for minerals, and we had no practice ourselves as geologists, most of our work was all thrown away. We found zinc and iron, but no gold. We used to hold regular meetings at Taylor's Settlement; but after sinking a lot of money and wasting our time, we concluded to separate, and the Association was dissolved by mutual consent in 1854. Meanwhile, I had been reading up in geology, and what time I could spare I devoted to its practice. In January, 1860, I was coming down the Tangier River over the ice, and fancied that I recognized a gold bearing strata, and resolved to conduct my explorations in that direction in the spring. Accordingly in May, I set out with a party of Indians, James Paul, *Joseph Paul* and Francis Paul, intending to have gone on as far as the Blue Mountains, but as we had nearly run out of provisions and the Indians are great eaters, we camped in the forest at Mooseland, while one of our party went off to procure supplies. While looking about me, I thought I saw quartz in the brook close by. I broke the stone up with my hammer, and in the fragments found pieces of gold sticking out. I then looked for more, and in nearly every piece that I broke

—it was quartz, you see—got more or less gold. Then I concluded to take my specimens up to town with me, and dismissed the Indians. This was on the last Thursday or Friday in May, 1860. The Indians are ready to swear that no white man had ever found gold there before. Mr. Howe was Provincial Secretary at the time. At first he would not believe that I had found the specimens, but when I proved that I was telling him no lies and asked him to get me a government grant to work the mine, he told me to "go home and mend my old shoes." On my way to Halifax, I had noticed other places shewing indications of gold-bearing quartz, one of which I pointed out to Mr. Peter Mason, living near the head of Tangier Harbor; and he, acting upon my information, made the discovery on his own land, which eventually led to the recognition of the district. I spent the winter on my farm at Musquodoboit; where I was pestered day and night by enquiries how to get to Mooseland? what does quartz look like? where is it found? so that I hadn't a moment's peace and often wished that I had never heard the word gold mentioned. Mr. Howe went down himself to Tangier in the summer, and afterwards published a letter advising the people to return to their homes for there wasn't enough gold there to make a lady's thimble of: However, in the spring of the next year, 1861, the people would not be kept back, and the government had to acknowledge that the gold did exist, and the district was laid off some time in May, and then all the other discoveries followed upon that. I have known ten men to take out one hundred and forty ounces in a fortnight. The Prince of Wales had a ring given to him, made from Nova Scotian gold. The government has never done anything for me, but made

me pay twenty dollars, like any other man, for a small claim twenty feet across the lead. I presented a petition to the House (of Assembly) through Adams G. Archibald, asking to be recognised as the discoverer of the first worked district, but never received any satisfaction. My petition was sent in 1864 or 1865, in the spring. I have found gold and silver too in other places since, and am only biding my time to say where."

CHAPTER VIII.

FURTHER DISCOVERIES.

THROUGH the discoveries at Tangier, specimens of gold-bearing quartz became freely distributed throughout the country, and the people learned with surprise that the stone, which they had hitherto called "white flint," and regarded as worthless, was likely to prove of immense value. Consequently, fresh explorations were made on private account in almost every county, and the Government, no longer able to resist the evidence of accumulated nuggets, ordered the most promising districts to be surveyed and laid off into areas, and appointed resident commissioners to superintend them.

The then Provincial Secretary (Hon. Joseph Howe), also commissioned Mr. John Campbell, already mentioned, to visit the eastern, and Mr. Henry Poole, manager for the General Mining Association, to visit the western counties, and to report to him the results of their geological observations. Subsequently Mr. Campbell was invited by the

Government to extend his investigations to Sable Island, being promised the control of any gold mines that he should discover, and the Government decide to work there. Having accepted this invitation, Mr. Campbell sailed for the Island in the revenue schooner "Daring," but after three ineffectual attempts to gain a landing, put back to Isaac's Harbor, on the main coast, where he disembarked and collected material for a second very interesting report, which was published by order of the House of Assembly, along with the Parliamentary papers for 1862-3. The Sable Island project was thus, for a second time, abandoned; the fate of a third expedition lies with the future.

The researches of geologists during the years 1861 and 1862, established the fact that a belt of metamorphic gold-bearing rock, consisting of five distinct bands, extends along the Atlantic border of the Province, a distance of more than three hundred miles. Traces of gold, too, were found in most of the rivers of the interior, and prove its existence, in place, in the hills of the north and west. But not every site where gold was found offered facilities for mining, and thus it happens, that although nearly fifty localities are known to be gold-producing, only eighteen have been officially proclaimed and surveyed.

The names of those districts are Old Tangier, Tangier Proper, Lawrencetown, Oldham, The Ovens, Wine Harbor, Renfrew, Sherbrooke, Waverley, Country Harbor, Isaac's Harbor, Gold River, Montague, Wagamatcook, Gay's River, Hammond's Plains, Stewiacke, Musquodoboit, and Uniacke, and a description of each, now under exploitation, follows in the order in which they are here enumerated.

CHAPTER IX.

PROCLAIMED DISTRICTS—OLD TANGIER.

THE district known as Mooseland, or Old Tangier, is about eleven miles from Pope's Head, a harbor on the south-east coast of Nova Scotia, fifty miles distant from Halifax. The first actual discovery of gold in quartz in this Province occurred here, and was made by Captain L'Estrange, of the Royal Artillery, in September, 1858, under the circumstances detailed in a previous chapter. In May, 1860, Mr. John Pulsiver, accompanied with one of Captain L'Estrange's Indian guides, found the same range of boulders, and through his representations to the government the district was officially proclaimed and surveyed in April, 1861. Approached by land, it is twelve miles from Tangier Harbor, but the road is through woods, and so rocky and swampy that a light chaise would be broken to pieces before it reached there; and a freighted waggon takes about five hours to complete the journey. Even on horseback it requires four hours to accomplish the distance. There are but ten families now residing at these diggings, though at one time some three or four hundred miners were encamped on them.

The first quartz mine was opened here by a party of eight young men of the Province, namely, John McKenzie, Morell, Veith, Taylor, Holdsworth, Okes, Verge, and Dickie, and their success attracted many hundreds to the spot, but the want of a proper drainage system and machinery for crushing, together with the isolation of the

district and the consequent expense and difficulty of procuring supplies, discouraged permanent settlers. The district contains a small hotel of the backwoods kind.

According to Mr. Campbell's report, the auriferous band observed at Tangier, is the one that lies nearest to the sea shore, and may be traced through Halifax Harbor to the Ovens. The prevailing rock is a dark clay slate, interstratified with occasional bands of gray flinty slate, containing thin laminæ of sesquioxide of manganese. The quartz veins occupy the soft shaly bands and follow the planes of bedding in the strike, but traverse the strata frequently in their dip, sometimes in waving and zigzag lines. The veins vary in thickness from one inch to six feet. The large ones have not yielded much gold as yet, and with few exceptions dip southwardly.

Only two companies are now operating here; one an association of provincial miners, the other a joint-stock association formed in Boston, United States, and styled the Beneficiary Gold Mining Company. From the mines belonging to the latter, some very handsome nuggets have been quite recently taken, and preparations are being made for extensive workings on the approach of spring. One specimen of quartz weighing twelve ounces, exhibited during the month of September last, at the office of Messrs. Huse and Lowell, contained eight ounces of pure gold, and since then a still larger nest is reported to have been found.

The product of gold from this district has been included in the returns for Tangier Harbor, and there is no possibility of ascertaining the precise quantity; but the following particulars obligingly communicated by Mr. D. Y.

Estey, the resident manager, illustrate the general character of the mines under development.

The Beneficiary Company's claims are traversed by thirteen lodes varying in thickness from one inch to six feet. Their course is due east and west, and they dip twenty degrees southward. Only four lodes, the Cumming, Furnace, Adams, and Edwards, are at present worked, and the greatest depth attained is (on the Furnace) fifty-eight feet. The quartz is very hard, and contains, besides gold, iron pyrites, zinc blende, galena, and at times, copper pyrites. The maximum yield was four ounces and eight pennyweights; the yield nearest the surface (at 15 feet), twelve pennyweights and five grains, and at greatest depth (58 feet) sixteen pennyweights and seven grains, which was the average of one hundred and fifty-seven tons. The extreme cost of obtaining an ounce, salaries, machinery, raising and crushing quartz and all incidental expenses included, may be assumed at eleven dollars; and nine dollars thirty cents as a fair average. The gold occurs in nuggets, spangles, and well defined crystals.

In 1862, the Chief Gold Commissioner, Mr. Samuel Creelman, in his report upon this district says: The difficulty of access to this section, *from the want of roads*, has prevented its resources being fairly investigated. The same remark holds good at the present day, for while other districts are accessible, the miners cannot be persuaded to remain in this. The owners of the Forrest Mine and the Beneficiary Company deserve well of the community for remaining and so sustaining the character of the field, which is likely to prove as rich as any that has yet been opened.

Placer diggings, but none of any moment, were in operation here in earlier days.

CHAPTER X.

PROCLAIMED DISTRICTS: NEW TANGIER.

THIS district, at the head of Tangier Harbor, was once a mere fishing village, but through the discovery by Mr. Peter Mason, fisherman and landowner, of a vein of gold-bearing quartz on his property in October, 1860, it quickly acquired an almost world-wide reputation. Conveniently approached by land or water, and communicating by a good post road with Halifax, it became the favorite rendezvous of gold seekers until fresh discoveries attracted them to other fields. The appearance which New Tangier presents at this day proclaims fully the ignorance and extravagant views which prevailed with regard to the distribution of gold at the time of its first discovery in the Province. The ground is fairly honey-combed with pits for a range of over two miles, some not deeper than three feet, some nearly sixty; and now all, except a few in the direction of Strawberry Hill, quite abandoned. It is true many holes have been dug in the most unlikely places; but many lodes too were actually laid bare, and then set down as worthless because they were not plated with metal.

This district is included in the proclamation of the 11th April, 1861, and, embracing Mooseland, extends about fifteen miles east and west, and two miles north and south. It possesses a good hotel, and the route from Halifax, *via* Preston, Porter's Lake, Chezzetcook, Petsquid, Musquodoboit, and Ship Harbor, offers many pleasing landscapes and views of several excellent harbors.

Twelve distinct quartz lodes, varying from one inch to four feet have been opened here and proved gold bearing. The most valuable are the South, the Leary, the Nigger and the Wallace. The South lode has been opened to the depth of ninety-five feet and the veins increase in richness as they descend; but no work has been done on it since 1862, when it was yielding an average of 3 oz. 7 dwts. per ton of 2000 lbs. according to the then Commissioner's report.

The Nigger lode has given some of the best specimens found in the district. The deepest sinking is sixty feet, and though near the surface the quartz barely paid expenses, at a depth of twenty two feet it gave 1 oz. and 6 dwts. to the ton. This lode is vertical to the depth of forty feet, but below fifty feet has a rapid underlie.

The Leary lode is from five to seven inches thick, has been traced upwards of a thousand feet, sunk on to the depth of fifty feet dips vertically, and averages 1 oz. 11 dwt. per ton.

The only works now being carried on are at Strawberry Hill on the Wallace lode, and a new lode recently opened. Both dip perpendicularly, average 1 oz. 5 dwts. per ton at the surface, and improve considerably as they go down. Mr. Campbell very emphatically says in his report of 1861, deep mining must be resorted to here in order to ensure success, and subsequent experience fully confirms his theory, not merely as regards this district, but every other in the Province.

The quartz is of various qualities, one variety is blue and slaty; another white, crystallized and transparent; and all contain iron pyrites, calc spar, native copper and arsenical pyrites.

There are two mills standing idle in this district, and, as it were, inviting the attention of capitalists. Unfortunately the ground has been so cut up through unskilled hands, that any one buying large tracts will be put to much trouble in removing obstructions, and filling up and levelling cavities; but a large quantity of the quartz now raised to the surface would probably pay the expense, and a handsome profit besides, if properly treated.

Profitable shore washings were carried on here in the years 1861 and 1862; and could again be resumed if suitable machinery was adopted and the management given to some one who has had a previous mining experience.

The total amount of gold credited to Tangier in the official returns is 2907 ozs. 9 dwts. 15 grs., of which 149 ozs. 9 dwts. was obtained from alluvium; but as the returns for 1862 are imperfect, and the greatest rush to these diggings was in the autumn of 1861 and spring of 1862, it may safely be estimated that one thousand ounces have not been accounted for. It would therefore be unfair to assume the present mean per ton or per man as a general average; because much better results can be obtained whenever the works shall be prosecuted with vigor and economy.

A nugget weighing twenty seven ounces, the largest as yet found in Nova Scotia, was sent from here to the Dublin Exhibition.

CHAPTER XI.

PROCLAIMED DISTRICTS: WINE HARBOR.

In the latter part of July, 1860, Joseph Smith, a resident of this district, found gold in the sands near the Barasois on the south-west side of Indian Harbor; and in the same month of the following year discovered gold-bearing quartz on the north-east coast of Wine Harbor; which led to the immediate survey and proclamation of the field.

Wine Harbor is about four miles distant from the mouth of the St. Mary's River, ninety miles eastward of Halifax. The route by land, *via* Sherbrooke, is about a hundred and ninety miles; and now that the railroad extends to New Glasgow, the journey can be accomplished in one day.

This district ranks third as a producer and second in its quinquennial proportion per man, and the depth, regularity and breadth of its lodes give security for its profitable working for years to come. Even with the small average of 12 dwts. 1 gr. to the ton, Wine Harbor in 1866, gave an annual proportion of \$716.75 to the man, or \$52.40 more than Victoria, the richest mining district in Australia.

The suspension of work pending the transfer of large developed areas, and the employment of men in prospecting on new ground, has created a decrease in the amount of gold produced during the past eighteen months, but the time has not been thrown away, and Wine Harbor will resume its place next year, as one of the leading mining districts in the Province.

The dip of the strata here is one foot in twenty to the south; the course of the lodes south 63° to 65° east, and

they follow the planes of bedding with great regularity. In referring to Wine Harbor, Mr. Campbell offers the following advice: "The explorer, on discovering a vein of quartz should not pronounce it valueless from the fact of its shewing no gold at the surface, neither should he pronounce any portion of a run barren from the fact of finding no quartz at the surface; indeed, without a thorough trial by deep sinking, miles of a run containing millions worth of gold, may be abandoned as worthless. From the fact of denudation having done so little to expose the gold deposits of this country, it is not improbable that, *when the rich placer washings of California and Australia shall have been exhausted, the rocks of Nova Scotia will be but beginning to exhibit the vastness of their stores of the precious metal.*"

The most noted lodes in these mines are the Smith, Middle, Major Norton, Barasois, Halliday, Wiscasset, Gillespie, and Eureka. They vary from one inch to four feet in width, and are encased in bands of slate and whinstone. Five tons from the Smith lode, crushed in 1862, gave one hundred and twenty five ounces of gold, and at fifty feet yielded a steady average of three ounces.

Among the most valuable properties may be classed the Orient Company's, the El-Dorado Company's, and the block comprising the Caledonia, Free Claim, Veith and Eureka lots; though it were invidious to draw comparisons where each one in almost any part of the field, if properly managed, is a fortune to the owner.

Discoveries were made this autumn at Doody's Head, which led to the extension of the district beyond the originally proclaimed limits. No work has been done on the new ground, but the boulders proved to be very rich, and

the consequent inference is that the lodes when opened will be rich too.

Wine Harbor is picturesquely situated, and offers many a treat to the angler and yachtsman. It derives its name from a vessel with wine having been wrecked, some years ago, on the sand bar which almost closes its entrance and renders navigation somewhat dangerous in hazy weather.

CHAPTER XII.

PROCLAIMED DISTRICTS: LAWRENCETOWN.

THIS district, named after Sir C. Lawrence, Governor of the Province, from 1754 to 1756, lies eastward of the metropolis, from which it can be reached either by land or water. The actual distance from Halifax by land *viâ* Cole Harbor, is about eleven miles, and through Preston thirteen miles. The roads are in good condition and the drive is agreeable by either route.

Mr. William Crooks, farmer, discovered what he supposed to be gold many years ago in this district, but, being ridiculed by his father, to whom he shewed it, threw the specimen away. When the excitement prevailed about discoveries at Tangier, it occurred to him to make search near the mill-dam on his estate where the discarded specimen had been found, and in May, 1861, in breaking up a boulder of quartz, which from description he had learned to recognize, he obtained several nuggets. The district was surveyed and lots taken up freely the same year.

From the present aspect of the place, the impression of the first gold seekers appears to have been that the precious metal would be found in thick layers at a few feet below the surface of the soil, and all that remained to be done after removing the ground to that depth was to cut up the gold in chunks and wheel it away. One company alone, known as the English Company, began with something like system, but they expended so much capital in mere preparations that there was none left for actual mining purposes, and through their failure the district acquired a bad name and was prematurely abandoned.

The prevailing rocks are grey flinty slate, interlaid with bands of soft bluish shale. The principal quartz lodes follow the dip and strike of the strata, and there are also some cross veins of great thickness. The strata resemble those passing through Wine Harbor and Indian Harbor, and form the second band from the sea shore of the auriferous metamorphic belt. The ordinary course of the lodes is due east and west, with an inclination of twenty degrees south, though many are quite perpendicular. One lode has been bared a thousand feet in length, and as many as forty distinct lodes have, according to Mr. Commissioner Creelman's Report for 1862, been opened on a single area of one hundred and fifty feet.

This district has not been sufficiently tested of late to give its present average; but a quantity of twenty-five tons crushed in 1862 gave as much as 3 oz. 7 dwt. 5 grs. to the ton British, and one hundred and seventy three tons of quartz, slate and detritus, crushed in 1863, gave 11 dwt 18 grs. per ton. Recent experimental crushings gave 1 oz. 3 dwt. per ton.

Placer washing was tried here to some extent in the

summer of 1862, and if ever resumed on a large scale with proper gold saving appliances, will yet become a source of considerable profit.

There is no hotel at Lawrencetown, and the whole population does not exceed twenty families. The vast property that belonged to the bankrupt English Company has just been leased, along with another large tract adjoining it, to some wealthy Canadians who contemplate working it scientifically, and their prospects of success are as certain as they are deserved.

A New-York Company commenced operations here during the past summer; their labor has been confined to prospecting only.

CHAPTER XIII.

PROCLAIMED DISTRICTS : OLDHAM.

THIS district offers nothing of interest except its mines to the mere tourist, but the geological observer would find fresh material for his note book on the occasion of every visit.

The first discovery of gold here is attributed to Edward Horne, of Elmsdale, and Samuel Isner, of Gay's River, and was made in the spring of 1861. The district, however, was not formally recognized until the 25th April, 1862, when subsequent discoveries by Amos Hough, Edward McDonald and Donald McKenzie, proved the abundant distribution of the precious metal.

"All the mines that have been opened in this district,"

says Mr. Campbell in his official report, "are ranged along a deep narrow valley, which extends for some distance in the anticlinal axis of the field, as if a wide chasm had originally been formed along the line of upheaval. Should this, on further examination, prove to be the case, extraordinary deposits may be expected towards the bottom of this fissure; and shafts should be sunk there for the purpose of exploring it. The surface indications throughout are of a most favorable character."

Operations in this field fully confirm the above impressions; the richest quartz having invariably been obtained from the deepest workings.

The general course of the lodes at Oldham is N 82° E. The "Hall" lode gave the extraordinary proportion of 116 oz. 2 dwts. 21 grs. to the ton of 2240 lbs., from a crushing made in June, 1864; but the "Barrel lode," so called from its waved or ribbed form, has given the richest uniform yield.

Although the gross product for 1866 was considerably below that of the previous three years, on account of the suspension of several works through extravagance and mismanagement, the average per ton was double the mean for 1862-65; and the annual earnings per man were \$525.36 against \$384.58 in 1865.

The Boston and Oldham Company, and a company formed at Montreal, have lately secured some of the best properties, and are now preparing to work them in a manner which promises to redeem the reputation of the district.

Oldham is about thirty-three miles from Halifax, thirty of which can be performed by rail. The post-road from the railway station is not macadamized, but in dry weather may be called good when compared with the roads in the

neighborhood of other diggings. The village has sprung into existence since the discovery of gold, and contains a chapel, schoolhouse, and about thirty resident families,

CHAPTER XIV.

PROCLAIMED DISTRICTS : THE OVENS.

ON entering the harbor of Lunenburg, on the south-west coast of the province, one may observe about four miles from its mouth, on the western side, a promontory fifty feet in height, which contains a dozen or more large cavities facing the sea. Those cavities, from some fancied resemblance, are called Ovens, and the whole peninsula, three-quarters of a mile in width and a mile and a-half in length, to which the gold mining district is at present limited, bears the same name. The regularity at which these openings occur almost confutes the idea of their being merely created by the action of the waves; they appear rather to have been made by human efforts, though for what purpose, unless for mining, it were difficult to conjecture.

The discoveries of gold in quartz were consequent upon those in Tangier; but Mr. Campbell and Professor Silliman obtained gold from the sea sand gathered on this shore in 1857 and 1859.

The discovery which led to the proclamation of the district, is ascribed, in the official reports of the Chief Commissioner, to Mr. James Dowling, and stated to have been made on the 13th June, 1861; but the friends of a

Mr. Herbert Tanner claim for him a still earlier discovery, which they alledge guided Mr. Dowling in his search.

But very little quartz mining has been done at the Ovens, yet sufficient to enable the Commissioner to report that the lodes increase in richness and in size as the depth increases. Veins which were but three-quarters of an inch at the surface, have, at a depth of twenty feet, increased to a thickness of five inches. The quartz band at the Ovens has been identified as the same which passes through Old Tangier; its quality, course and dip, vary but little. Mr. Poole's report gives the strike S. 75° W. to N. 75° E., and the dip as nearly vertical. The quartz veins contain large quantities of arsenical pyrites, with a free distribution of iron pyrites; galena and mica occur but rarely. There is no doubt that the pyrites is rich in gold and silver, for a few barrels of unassorted ore from the McCulloch claims assayed by Messrs. Johnson, Matthey & Co., the assayers to the Bank of England, gave at the rate of 242 oz. 16 dwts. of gold, and 16 oz. 5 dwts of silver to the ton of quartz; and other specimens yielded in still larger proportion. But this system of reporting partial assays is more damaging than profitable to a company, because it misleads the public, and makes the purchasers of stock over sanguine. The very claims from which this good assay was made have been offering in the London market since January of the present year; but some of the statements put forward in the company's prospectus are so extravagant, they contain so much of the bogus lottery style about them, that they have created a distrust toward all the gold mines in the province; their own more than any other. An exposure of the mis-statements referred to will appear in a future chapter,

describing the causes of prejudices against the Nova Scotian Gold Mines.

The real average per ton British, in 1862, was a little over an ounce; and at the greatest depth (60 feet) since reached, the yield has been from 1 oz. 15 dwts. to 2 oz. With a good crusher and proper amalgamating process there should be no difficulty in sustaining the latter average, and as the ore is easily worked and the ground well adapted for mining purposes, though wanting in a good flow of fresh water,—profitable operations can at any time be resumed, and it is a pity to see a district offering so many advantages for investment, abandoned through the mistakes of mere gold hunters, or, what is worse, prejudiced through the Munchhausenisms of bubble company promoters.

Mr. B. Reinhardt, the late Deputy Commissioner, estimates the quantity of gold obtained from the shore washings at the Ovens, during the autumn of 1861, at two thousand ounces. The reported yield for 1862 was only three hundred and eleven ounces; and since then they have been abandoned. As the process of denudation continues, that of deposit must continue, too; and the author, from experiments recently made by himself, is able to assert that the sands are still gold-bearing and worth being tested afresh.

The Ovens diggings are thirteen miles from the town of Lunenburg, by the high road; but by boat across the harbor, four and a half miles. The best landing place is at Spindler's cove. Only seven families are now residing there; but several tenantless houses bespeak a large mining population in 1862 and 1863, while the gold fever lasted. Its estimated distance from Halifax is 65 miles. Lunenburg itself, as the oldest British town in the Province, after Halij-

fax, will be a point of interest to the traveller, being picturesquely situated, and approached by excellent roads. It contains a capital hotel (Kings'), and there is good boating and fishing in the harbor. .

. CHAPTER XV.

PROCLAIMED DISTRICTS : RENFREW.

THIS district, originally known as the Nine Mile River Settlement, owes its recognition, as a gold field, to the discoveries of John McPhee, William Thompson, and Andrew Parker. The first named discovered quartz in July, 1861, but there is no evidence to show that he obtained gold from it; the second, in September of the same year, found a piece of loose quartz containing gold, in a brook near his own mill; and the last named, in April, 1862, struck a rich vein in the solid, close to the spot of Thompson's discovery. The district was surveyed, and proclaimed forthwith, and then prospecting and mining promptly followed.

Here, as in other districts, experience had to be dearly purchased. Men who expected to make fortunes in a few days by playing for a while at navvying, and digging a hole here and a trench there, were soon disappointed, and left the field in disgust to others who practised mining as a business and a science. The consequence is that the Renfrew gold mines, especially those of the OPHIE Company, are now looked upon as the most valuable in the province; and prove indisputably that good *management*, using the word

in its most comprehensive sense, is alone required to make quartz mining remunerative.

Mr. Campbell speaks thus of Renfrew in his official report: "Gold is so abundant in some of the veins, that it is difficult to find a piece of quartz a few cubic inches in size, that does not contain more or less gold; indeed, some of the quartz is so rich that scarcely a piece, even one cubic inch in size, can be found that does not contain gold."

But the actual yield of the past five years attests the productiveness of the district better than the report of the most skilled geologist after a few days' investigations. Note, for instance, the following: Seventeen tons and twelve hundred weight of quartz taken from the "Free Claim" lodes in 1862 gave seventy-three ounces and four penny-weights, or, on average, over four and a-half ounces to the ton. The yield of gold for 1863 was double that for 1862; the yield for 1864 exceeded the sum of the two previous years; and the yield for 1866, which includes the first operations of the Ophir Company, was actually double that of all the former years, added together. Equally satisfactory is the yield per man, which in 1862 only amounted to an annual proportion of \$176, but in 1866, rose to \$1050.90; or \$3.21 for the working day. The Ophir Company alone produced 2913 oz. the first eight months of its incorporation.

The mines of this district are almost entirely controlled by Americans. The most noted claims are those of the Ophir Company, an association formed in Boston, Massachusetts, and incorporated by special charter from the Nova Scotian Government. The articles of association are dated the 28th day of February, 1866, and the Provincial charter was granted on the 5th September, 1866. The trustees are

Messrs. Charles F. McClure and Gilbert Attwood, two gentlemen of Boston, who individually have done more to retrieve the character of the gold fields of Nova Scotia than all the government officials and previously organized companies interested in their development.

The property of the company consists of nineteen areas situated in a very favorable part of the district. Only seven are under present exploitation. Those are traversed by three lodes—the North, South, and Brook, averaging from three to twelve inches in thickness, and yielding at a depth of one hundred and fifty feet, the maximum yet attained, one ounce and five penny-weights from crushings of quartz and slate mixed together. The course of the lodes is north-east by south-west, and the dip 47° to 50 N. At seven feet from the surface, the average yield from pure quartz, was 2 oz. and the maximum yield 4 oz. 10 dwts. per ton. The average depth of soil is five feet. The lodes do not appear to decrease in width or richness as they are followed down, and the present indications favor the anticipation of pay ore continuing to a depth of several hundred feet. The wall rock is a band of soft slate, and from recent experiments proved to contain about 5 dwts to the ton, so that it is not separated from, but crushed along with the quartz. Some trials made with quartz obtained at a depth of 60 feet, gave the following results:

1st. lot	6 tons	15 oz. 10 dwts.
2nd. "	10 "	31 — "
3rd. "	20 "	91 " 10 "

Total 36 tons. Mean 3 oz. 17 dwts.

The undeveloped areas belonging to this Company are supposed to contain several rich lodes, and they have also

a lot on the celebrated Preeper lode, which in 1862, from 83 tons of quartz taken from a depth of only 6 to 8 feet, yielded 180 ounces of gold. The course of this lode differs from the adjacent lodes, being S. 85° E.

The Ophir Company's Mill is driven by water, and runs sixteen stamps, and is one of the most effective and most economically worked in the province. In fact the Ophir Mines are admitted to be the pattern mines of Nova Scotia, and the tourist, however pressed for time, must not omit visiting them. The trustees may well be proud of their creation, for, to quote the words of a contemporary report: "*It is almost unparalleled in the history of mining operations that a mine has been opened to so large an extent, buildings erected, machinery procured, and in fact the whole mining plant paid for, and a very handsome surplus earned above all these preliminary and necessary expenditures, out of the profits of the mine from the start, and without a call of a dollar from the shareholders, IN THE SHORT SPACE OF EIGHT MONTHS.*"

The New Haven and Renfrew Gold Mining Company, and the Hartford Gold Mining Company, both under the excellent management of Colonel Charles W. Allen, have well located claims, and although eclipsed in prestige by the Ophir, tend not a little to sustain the reputation of the field.

About three miles north-west of the quartz mines, alluvial washings have lately been discovered on the so-called Nine Mile River. Not having visited the locality we cannot pronounce upon them, except from the reports of practical miners, who are not very sanguine of finding rich deposits. There is really gold there, for several specimens

have been brought to town, but to what extent it is impossible to offer even a conjecture.

Renfrew is thirty-seven miles from Halifax, thirty of which may be performed by rail. Four horse stages are in attendance at the station to convey travellers to the diggings. The first four miles of the coach road are in good condition; the remainder stoney and full of ruts. The village contains a good hotel and about sixty houses, and is named in honor of the Prince of Wales who travels incognito as Baron Renfrew.

CHAPTER XVI.

PROCLAIMED DISTRICTS: SHERBROOKE.

If any one should doubt the possibility of profitable gold mining in Nova Scotia after a visit to the Renfrew fields, let him call at the Chief Commissioner's office and examine the returns from Sherbrooke, a district which contains a larger developed area, and during six years has given a higher *sustained* average to the ton of ore and per man, than any other in the province. Yet here, too, abandoned trenches, ill devised shaftings, and heaps of good and bad ore mingled together, tell of thousands of days of unprofitable labor, and if after so much wasted energy and capital, the average of six years is so high, what may not be hoped from a new and skilful system of mining. The steady increase here, both in gross production and in the proportion per man, impartially told by statistics, pointedly

expresses the advantages of quartz mining in at least one district of Nova Scotia.

Year.	Gross Gold Yield.			Annual Average per Miner.	
	oz.	dwt.	grs.	\$	c
1862.....	2,023	0	0	561.95	
1863.....	3,304	14	12	660.95	
1864.....	3,419	1	20	653.95	
1865.....	3,424	12	21	928.57	
1866.....	5,829	13	8	1617.45	
1867(nine months only)...	6,755	9	6	1669.20	

The total product for 1867 will be, approximately, nine thousand ounces, and give an actual average of five dollars and thirty-two cents, to the man per day, if the present yield continues; but the prospects are that there will be a large increase; as new companies have commenced working tracts that for a long time have lain idle, and the old companies are raising some of the best ore this or any other country has produced.

The village of Sherbrooke, named after Sir John Coape Sherbrooke, governor of the province from 1811 to 1816, is situated near the head of the St. Mary's river, on the east side. The surveyed gold region embraces a tract three by six miles in size, but would bear extending to fifteen by twenty-five miles. The developed mines are at present confined to the village of Goldenville on the north west side of the river, opposite to Sherbrooke proper. The first gold in quartz was discovered here by Mr. Nelson Nickerson, on the 23rd August, 1861. The origin of the discovery is thus told by Mr. Commissioner Creelman, and substantially agrees with Mr. Nelson's own report to the author: "In the summer of 1861, Mr. Nickerson, having by a visit to Tangier gained the information necessary to

enable him to distinguish quartz from other rocks, returned home, and while engaged in making hay in a small meadow about a mile and a-half west of the north-west arm of the St. Mary's River, he noticed quartz rocks scattered over the land in different places that had become exposed to view by the action of extensive fires, which had raged through the forest at different times within the previous twenty years. By examining and breaking quartz he found gold, and was so much encouraged by the quantity thus obtained, that it became the principal business of himself and family for some time, which, however, they managed to keep secret.

"About the first of October, his neighbors began to suspect that he was obtaining the precious metal somewhere in the forest. He and his family were closely watched in their movements from that time, until about the fifteenth of the month, when he was discovered by the sound of his hammer. On the 18th of October, when this fact became generally known, over two hundred men assembled on the ground, who on that one day obtained gold by breaking quartz to the amount of four to five hundred dollars worth.

"A surveyor was immediately sent to the ground, with instructions to lay off areas and receive applications for leases, and in a short time active mining operations were in progress. Previous to the first of March, 1862, the number of applications for leases of various sizes, but principally for class number one, was 69; and by the end of the year four hundred and eighty were taken up."

The Deputy Commissioner for that year remarks: "Many of the areas were taken up by parties on speculation and never worked; some by persons who, on working a week or a month or two, exhausted their means, and, not

having obtained gold, abandoned the mines, and circulated injurious reports in reference to them. Others, who had the energy and capital to continue their operations, are generally doing well, and some of them are making fortunes."

The following report of the principal lodes, though prepared in 1862, by the deputy commissioner of the district, will be still extremely valuable at the present day :

Name of lode.	Maximum Yield.	Average per ton.
Cumminger.....	2½ oz	1½ oz
Aikens.....	7 "	1½ "
Hayden.....	7 "	3½ "
Drysdale.....	8 "	2½ "
McKay.....	7 "	4½ "
Blue.....	9½ "	4½ "
Hewitt.....	12 "	4 "

The Cumminger lode varies from one foot to two feet in thickness, having a band of slate six feet thick on its northern side, and a dip of 45° north. The north side is considerably richer than the south.

The Hayden lode consists of a number of small veins running closely together, varying from one to four inches in thickness.

Aikens' lode is from two to three inches thick, dip nearly vertical.

Drysdale lode is thin at the surface, not being over half an inch; but at a depth of fifteen feet it already increased to six inches. The dip is nearly vertical.

The McKay lode has a dip of 50° south, and on one claim varies from three to six inches in thickness, while on the adjoining claim to the west, it shows a thickness of one

foot. The rock is much shattered on this lode, and water flows through it rather freely.

In the Blue lode, the quartz, as the name indicates, is of a deep blue color, and the dip is 40° north. A band of soft slate, varying in thickness from four inches to one foot, encases the north side of this lode.

The Hewitt lode is composed of two veins, separated by a thin seam of slate. The larger vein, one foot thick, yielded at first working but six pennyweights to the ton. The smaller vein has proved very rich, and varies from three to six inches in thickness. The lode is vertical.

Since this report, several new lodes have been opened and worked; though most of those called new lodes, are, in point of fact, but the continuation of the old. Recent prospecting has developed some very promising runs down to the river's edge, which have again been traced to the eastern side through the McDaniels and Lynch properties. Mount Prospect, belonging to the latter, contains several good quartz lodes and other metalliferous veins, and would well repay systematic exploitation.

One lot of four hundred weight of quartz, crushed in June, 1863, gave the high proportion of 147 oz. 5 dwts. to the ton; and one hundred and sixty five tons raised in August last from the New York and Sherbrooke company's claim, gave a gross yield of seven hundred and twelve ounces.

Perceiving the evil of being limited to space, and that from that cause alone the operations of different companies have been brought to a sudden stand-still when at the height of their prosperity, investors have of late inclined toward securing large tracts of from forty to fifty areas so situated as to intercept the course of the best lodes in the field;

and as instances of judicious selection may be mentioned, the properties belonging to the Blue Lode, the Nova Scotia, the Intercolonial and the Stanley Companies, which, under coming development, are likely to rival some of the favorite mines in the province.

The leading companies under present development are the Wellington, the Palmerston, the Dominion, and the Derby and Hayden, and there are several mines in private hands doing remarkably well. The subjoined impartial reference to three companies respectively created in Boston, Montreal and New York, shews that the elements of success are not in the birth-place of an enterprise, but entirely in its management.

The Palmerston Company was incorporated at Boston, Massachusetts, in November, 1866. Its nominal amount of capital is sixty thousand dollars, and the shares, originally at one dollar each, are now firm at \$2.15. The company owns twenty-nine areas: four only are under present development. The lodes, of which there are several, vary from two inches to eighteen inches in thickness, and run in belts of slate, 8 to 10 feet wide, near together. Their dip is vertical, and the general course from east to west. The average yield from crushings of quartz and slate together amounts to one ounce and a quarter per colonial ton. The quartz is soft and contains iron pyrites. The cost of raising and reducing averages six dollars and seventy cents. The company employs about forty miners, owns a mill and shafthouses worth six thousand dollars; and has supplied at the rate of two hundred ounces per month since taking possession.

The Dominion Company was incorporated at Montreal, Canada, on the 13th May, 1867, and its shares, issued at

one dollar, were quoted at two dollars before the company had been three months in existence. Within the limit of nine areas, two of which only are as yet developed, there are seven valuable lodes exposed, and eleven others, nameless and unworked, varying in thickness from three to eighteen inches. At a depth of seventy feet, the yield of one lode averaged three ounces and a half per ton. The quartz mines easily and contains sulphurets of iron and copper. The general course of the lodes is from north-east to south-west, and the dip 80° south. The mining plant on this company's property is worth about a thousand dollars; and with only twenty-two men, and considerable dead work ahead on taking charge, the product of the last two months has exceeded five hundred ounces.

The New York and Sherbrooke Company, as the name suggests, is of New York origin. It was formed in 1864, and owns forty-four well located areas, but has confined its exploitations to only five. Twenty-five known lodes traverse this property, and they vary from one inch to three feet in thickness, coursing east north-east by west south-west, and dipping 45° to 47° south. Fourteen shafts have been sunk, of which five are now being worked. The greatest depth yet attained is one hundred and sixty feet, and the yield from that depth two ounces per ton. The quartz is hard; contains sulphurets of iron, copper and zinc; and also molybdenum and lead. The maximum yield has been nine ounces per ton, and one hundred and sixty-five tons from a depth of forty-five feet gave an average of four ounces and four penny weights. The company employs forty-five miners, and owns a mill and mining plant worth about six thousand dollars. There have been no transactions in its

stock, but it is under scientific management, and deserves the full confidence of its proprietors.

Our limits will not allow further descriptions in detail; but the reader interested in mining economy is referred to the list of organized companies in the appendix, and invited himself to institute comparison between their average production, and that of the most successful companies in other parts of the world.

Sherbrooke proper is about one hundred and eighty miles from Halifax, and the journey can be performed by rail as far as New Glasgow, and thence per coach, in one day. The traveller will find excellent accommodation at the Sherbrooke House, kept by Captain McDaniel; or if inclined to stay on the diggings, will obtain good cheer at the Rockville. The district contains schools and chapels, and is capable of supporting a large population. It is pleasantly situated and well worth visiting.

CHAPTER XVII.

PROCLAIMED DISTRICTS : WAVERLY.

SINCE quartz mining commenced in Nova Scotia, Waverly, among foreigners, has been looked upon as the representative district. The reason of this is its proximity to Halifax. By rail the distance is about fourteen miles, by coach-road from Dartmouth not more than eleven; just enough for a pleasant excursion. On this account every one who has felt a curiosity to see a gold mine has been to

Waverly, and so much has Waverly been written and talked about that the other districts rarely have been referred to. From this circumstance Waverly has gained prosperity ; its development being mainly due to notoriety, its notoriety as stated, to its proximity to town. The same amount of labor expended in any other district would have given quite as good, if not better results, for the average per ton is low, and the profits from mining in this district are due to the large scale on which operations have been conducted. From a settlement containing about twenty scattered farm houses in 1860, Waverly has risen to a village of considerable importance, whose inhabitants may be estimated at nearly two thousand.

"Waverly," says Mr. Creelman, "is separated into two divisions by the Shubenacadie chain of lakes, which are known as the east and west divisions.

"The first discovery of gold in this district, brought to the notice of the public, was made by Alexander Taylor, on the 23rd August, 1861, in the west division, on the eastern edge of Muddy Pond, on the Waverly farm, the property of the late Charles P. Allen. The specimens obtained during two day's search—broken from surface boulders lying about the same spot—were sold in Halifax for eighty dollars.

"From the proximity of this place to the city, a large number of people was immediately upon the ground, and many claims were applied for. A movement was afterward made by several merchants of the city, to form an association to prospect this and other districts on a larger scale than had up to this time been done, and arrangements were made by which the association obtained the privilege of search on the Waverly farm until the first of May, but

were not successful in the discovery of any sufficiently auriferous quartz lodes to warrant the taking up of any large areas.

"On the first of May, a vein of gold-bearing quartz was exposed by the original discoverer, at the place where the first specimens were found, and in ten days new applications were made for fifty or more areas of class number one.

"Gold was subsequently discovered in the Eastern district by James Skerry, on the 14th of September, 1861, on the high ridge of land on the east side of the main post road leading to Truro, known as Laidlaw's Hill, immediately opposite and within three-quarters of a mile of the place where the discovery was made in the Western division. The attention of the discoverer was first attracted by some loose boulders, which on being broken, gave sights of gold. The boulders were imbedded in gravel, which at this spot was about three feet deep. On clearing the gravel away, there appeared what at first was supposed to be a very thick vein of quartz. A width of about six feet was exposed, and in breaking up the quartz—which at this point was very rich—that peculiar barrel formation, which has since excited so much curiosity, was disclosed."

Mr. J. Arthur Phillips, F. C. S., an eminent mining engineer of London, thus describes the barrel formation :

"The most remarkable deposit of auriferous quartz hitherto found in Nova Scotia, is undoubtedly that of Laidlaw's farm. The principal workings are here situated near the summit of a hill composed of hard metamorphic shales, where openings have been made to the depth of some four or five feet upon a nearly horizontal bed of corrugated quartz of from eight to ten inches in thickness. This auriferous deposit is entirely different from anything I had be-

fore seen, and, when laid open, presents the appearance of trees or logs of wood laid together side by side, after the manner of an American corduroy road."

"From this circumstance the miners have applied the name of "barrel quartz" to the formation, which, in many cases, presents an appearance not unlike a series of small casks, laid together side by side and end to end.

"The rock covering this remarkable horizontal vein is exceedingly hard, but beneath it for some little distance, it is softer and somewhat more fissile. The quartz is itself foliated parallel to the lines of curvature, and exhibits a tendency to break in accordance with these striæ."

"The headings, and particularly the upper surfaces of the corrugations are generally covered by a thin bark-like coating of brown oxide of iron, which is seen frequently to enclose numerous particles of coarse gold, and the quartz in the vicinity of this oxide of iron is itself often highly auriferous."

It may be that this barrel formation is of the same kind alluded to by Dr. Ure, as follows: "Auriferous deposits occur in Hungary, almost always in the neighborhood of *lignites* and the *petrified wood*, covered with gold grains found at a depth of fifty-five yards in clay in the mine of Vorospatak, near Abrabanza, in Transylvania; might lead to presume that the epoch of the formation of the auriferous alluvia is not remote from that of the *lignites*. The same association of gold ore and *fossil wood* occurs at Moco, in South America, and Floro at twenty feet."

The general course of the ridge of "barrel" is north 77° 15 east.

At the end of 1866, Waverly had contributed over thirty-six per cent of the gross yield for the province, very

nearly one-half of which was produced in the year 1865; when the German Company's claims belonging to Mr. Bürkner alone contributed twelve thousand ounces.

For some inexplicable reason this district lately has fallen into disfavor, but it still contains many valuable lodes, and the north-west end offers a field for further explorations. Mr. Campbell suggests that rich deposits of gold may exist in the drift lying to the south-east.

There are but three companies with any force now operating at Waverly—the DeWolf, the Bürkner, and the Boston and Nova Scotia, and through their example and exertions the district promises soon to retrieve its former note.

CHAPTER XVIII.

PROCLAIMED DISTRICTS: COUNTRY HARBOR.

THIS district lies on the Country Harbor river, in Stormont settlement, and is about one hundred and ninety miles by road from Halifax.

Although opened and discovered in September, 1861, no operations of any account were begun until the present year. The mines are on excellent ground, the quartz veins are numerous, and the yield of gold from sundry tests has averaged 1 oz. 17 dwt. 8 grs. to the ton, British, and given a maximum of 5 ozs. 10 dwts. 13 grs.

"The course of the lodes varies here largely from that of any other worked in the province," says Mr. Creelman. Those cropping out at the water level having a course of N. 32° W. and those on the height being about N. 52°

W. The lodes vary in thickness from three inches to two and a half feet, and become richer as they descend. The greatest depth yet reached is twenty five feet. With the advantages of position which this district offers, being at the head of a good harbor and near to a post road, it is surprising that it has failed to receive the attention of capitalists, though this fall there were signs of awaking interest. The discovery of gold which led to the proclamation of this field is attributed to a Mr. J. Fraser, and was made in September, 1861.

CHAPTER XIX.

PROCLAIMED DISTRICTS: ISAAC'S HARBOR.

THE district known as Isaac's Harbor, lies eastward of Halifax, and about eleven miles beyond Country Harbor. There is a short cut through the forest from Wine Harbor, but the path is only fit for pedestrians and not of sufficient width for waggon traffic. The traveller starting from Wine Harbor, then, would have to make a detour of nearly fifty miles through Sherbrooke, Melrose, Guysborough Cross Roads and Country Harbor, to reach a place which in a direct line is but fifteen miles distant. By water the estimated distance from Halifax, is one hundred and fifteen miles.

The district is also called Stormont, and was settled by discharged soldiers who had served in the American war of 1812, and principally belonged to New York, Pennsylvania and Carolina. Some of the officers brought African ser-

vants with them, who have perpetuated the race throughout the settlement. At present it does not contain more than fifty families, of which only two or three are interested in the mines, the rest being fishermen or farmers.

The *creation* of this district is thus described in Mr. Commissioner Creelman's report :

"Gold was first discovered at Isaac's Harbor on the 14th day of September, 1861, by Joseph Hynes, under the following circumstances: A young man by the name of Elias Cook, had been at Wine Harbor mining, a short time previously, and had obtained some specimens of gold-bearing quartz. On his return to Isaac's Harbor, he observed a similarity in the rocks of the latter place to those of Wine Harbor, and, in company with Allan McMillan, commenced a search for gold, but found none. At length Cook dropped one of the Wine Harbor specimens, and McMillan, in searching, picked it up. They immediately returned home with the exciting intelligence that they had discovered gold, upon which a number of the inhabitants at once repaired to the spot; but after a fruitless search for several hours, returned disappointed. Joseph Hynes, however, on the afternoon of the same day, resumed the work of prospecting, and on what is now called the "Free Claim," in the west division, obtained several fine specimens of auriferous quartz. On the same evening, John Latham and others found several pieces of gold-bearing quartz on the Burke lead."

In the East Division, the first discovery of gold was made by two Indians, on what is now called the Mulgrave lead, a short time after the discovery on the west side.

At Isaac's Harbor, the Mulgrave lode stands first in importance as being the most remunerative. The average

yield is 1 oz. 13 dwts. and the largest 5 oz. 6 dwts. of gold per two thousand pounds of quartz.

The Victoria averages 1 oz. 7 dwts. and has given as high as 2 oz. 12 dwts. per ton.

The Burke lode, West Division, averaged 2 oz. and gave a maximum of $6\frac{1}{2}$ oz. per ton.

The Fraser lode is over twelve feet in width. Forty tons of quartz from the same, gave 120 oz. of gold,

At the period of visiting this field (September, 1867,) there were only three companies operating on the eastern and none on the western side; but since then activity has revived and several lots have been taken up in consequence of new discoveries at Hurricane Point and other places.

Profitable placer diggings existed on the western side in 1862, but were suddenly, and from actual appearances, prematurely abandoned.

Isaac's Harbor is admirably situated for mining operations, the field is extensive, and the proportions per man and per ton have been uniformly high; and if frequent communication were opened with the metropolis it would soon acquire popularity. The following entries taken from the Deputy Commissioner's book, bespeak at all events the capabilities of the district.

"Fourteen tons of quartz from lot 11, Eastern Division, gave 82 oz. 2 dwts."

"Nineteen tons, six hundred weight from lot 453, Western Division, yielded 51 oz. 8 dwts."

"Fifteen tons, twelve hundred weight from a depth of one hundred feet from lot 72 Eastern Division, produced 133 oz. 4 dwts."

To the mere tourist Isaac's Harbor offers more inducements for a prolonged visit than any other district; he will

there find plenty of employment for his pencil, rod, or gun, and a most obliging guide in Captain Taylor, the resident commissioner, at whose house, in the absence of any established hotel, he will also receive very hospitable entertainment.

CHAPTER XX.

PROCLAIMED DISTRICTS: GOLD RIVER.

This field, situated on a capital mining ground on the banks of a river, as the name indicates, is about eight miles west of Chester, four miles from Chester Basin, and fifty miles from Halifax. It has not yet produced a sufficient quantity of gold to have earned its name, but the Chester Mining & Improvement Company, formed in New York and operating here these last few months, is vigorously prosecuting the work of development, and the ore raised from its claims has given very satisfactory assays; both gold and silver. The rock is very hard, in places more so than any in the Province, but the lodes are of great width and promise so well that the company is about erecting a crusher and other machinery, and will thus be in a position to shew good results before long, if at all obtainable.

Gold has been washed from the sands of this river, and further exploration may yet lead to valuable discoveries.

The opening up of the district is due to Mr. Dimmock of Chester, who found the first gold in quartz in September, 1861.

CHAPTER XXI.

PROCLAIMED DISTRICTS: MONTAGUE.

This district, named after Major Montague, a retired officer of the British Army, on whose domain it lies, although not more than six miles from the metropolis, is almost entirely abandoned. There is no satisfactory reason for this inappreciation of a field where the distribution of gold, as proved by the average of crushings of more than eighteen hundred tons of quartz, is so very even. The ore is very rich in iron and arsenical pyrites, which by proper means of extraction could be made to give a large yield of gold. The Union Company is the only one working here now; but the property of the late Albion Company has just been taken by parties likely to develop it in a systematic, and eventually profitable manner.

The quartz lodes improve in depth, and in 1865 gave an average of \$29.04 to the ton, and \$513.85 for the year to each miner.

When first opened the district was called Lake Loon Gold Field, and a reference to it by wholly disinterested writers will be found in another part of this work.

CHAPTER XXII.

PROCLAIMED DISTRICTS: WAGAMATCOOK.

It cannot be the name which keeps people away from this district, for there are favorite diggings in other countries of still harder pronunciation, and its temporary abandonment is owing, says Mr. Hamilton, in his last report, to the

absence of roads and consequent comparative inaccessibility, and certainly very little can be done in such a country until roads are made.

The district is also known by the name of Middle River, and is situated westward of the Baddeck Mountains in Victoria County, Cape Breton. It can be approached by stage, but the preferred route is by steamer to Sydney and thence by private team ; or by rail to Pictou, thence by steamboat to Port Hood and from there by stage or private conveyance. Either way the journey occupies about four days in going from Halifax, and as works were reported as being entirely suspended the author failed to visit this district.

Late reports favor the presumption that in practical hands its mines may be exploited to great advantage.

One John G. McLeod received a free claim in April, 1864, which implies that he was the original discoverer of gold in the district.

CHAPTER XXIII.

PROCLAIMED DISTRICTS: GAY'S RIVER.

THIS District is about forty-seven miles from Halifax, on the old Truro road. The traveller leaves the train at Shubenacadie, and procuring a chaise at Archie Nelson's Union hotel, after a drive of twelve miles eastward, along a good road, will find himself at the diggings, situated on the Cold Stream Brook, a tributary of Gay's River.

Discoveries of gold were made here almost simultaneously in the month of June, 1862, by George Gay and Berry Corbett, on their own farms, which are only divided by the brook. Systematic mining did not commence until late in 1863, and has at no time been prosecuted in a manner to sufficiently test the capabilities of the district. Both from its position and the results of the small experiments that have been made, the field appears deserving of attention, and proper exploration will probably lead to the discovery of rich quartz veins in the vicinity, from which the alluvium has received its deposit of gold.

The gold chiefly occurs in a curious conglomerate, but it is also found in a greasy slate and a species of clay stone.

Only two families live in the immediate vicinity. The district is called after a man named Gay, who was drowned in the river some years ago.

CHAPTER XXIV.

PROCLAIMED DISTRICTS : UNIACKE.

ON the 18th June, 1865, Messrs. Daniel Mackintosh, John Sims, and Charles Sims, discovered auriferous quartz lodes in the forest, on the estate of the late Hon. Richard J. Uniacke, about three miles north-east from the Mount Uniacke Station of the Windsor Branch Railroad. The prospect was found to be so promising that, according to Mr. Hamilton's report, before the following summer there was already occupied, under leases and prospecting licenses,

a larger tract in this district than in any other in the province.

The rapid growth of this district is ascribed to secret influences, and partially reported crushings. In December last there were only two houses on the field; now it contains more than fifty, and over two hundred residents.

Some very rich specimens have lately been raised, especially from a claim known as the 'Government Farm,' to which, it appears, there is a little history attached.

One hundred tons crushed here in 1866, gave an average of \$57.20 to the ton, and the mean for the present year, though not quite so high, verifies the late Chief Commissioner's prediction, that the Uniacke Mines bid fair to equal in productiveness those of any other district in the province.

CHAPTER XXV:

SURVEYED BUT NOT PROCLAIMED DISTRICTS.

THE districts liable to the classification which heads this chapter, are Chezzetcook, a French settlement, thirty miles east from Halifax, near a good harbor, and on the same auriferous belt which passes through Tangier. The Mines were first opened in 1864, but quickly abandoned, and have recently fallen under the control of Colonel Gregory, an American gentleman, who is making preparations for testing them thoroughly and impartially, having been encouraged by the discovery of new, and so far as opened, well-paying lodes.

Stewiacke was opened this present year, and has produced some rich specimens, but at present only prospecting has been reported.

Hammond's Plains district, laid off in 1863, is now abandoned, having failed to answer public expectations in any respect whatever.

Middle Musquodoboit has all the appearance of a good field, but at present is inaccessible from want of roads.

Upper Musquodoboit has failed to secure development from the same cause.

CHAPTER XXVI.

DIVERS UNSURVEYED AND UNPROCLAIMED DISTRICTS.

THERE are many places in the province where discoveries of gold have been made, and free claims obtained, but no developments attempted, because discoveries of the kind have become so common that it is very difficult to awaken any interest in them; and the original discoverers have had neither time nor means to prosecute their explorations any farther. Among these districts, Ship Harbor, Sheet Harbor, Moses River, and Scraggy Lake, appear likely to receive future recognition.

The whole tract between Chezzetcook and Ship Harbor is rich in quartz veins, especially that part known as Jed-dore Barrens, and the author from his own experience would recommend prospecting in that direction.

There is also an extensive field near the Guysborough Cross

Roads, on the route to Country Harbor, that would be likely to repay exploration. Indian Harbor, too, contains wide quartz lodes, but they have not yet been tested for gold.

CHAPTER XXVII.

REPORTS BY GOVERNMENT EXPLORERS : MR. POOLE.

IN September, 1861, Mr. Henry Poole, then Superintendent of Mines for the General Mining Association, was commissioned by the Provincial Government to visit the western counties, and report geologically upon them. Although late in the year when he received his commission, Mr. Poole went with ardor to the task, travelled over fifteen hundred miles of ground (two-thirds of which on foot), collected a quantity of valuable specimens, visited over one hundred districts, and on the 31st of January, 1862, submitted a very interesting report, from which we gather that the whole coast line west of Halifax offers great inducements for further systematic exploration.

The places visited and named by Mr. Poole, as likely to be gold-producing, or where quartz, pyrites, and other favorable surface indications exist, are the following:—

CHESTER DISTRICT, Eisenhaur's Hill, Deep Cove, Aspotagon, *The Bend, (Gold River), Gold River, Martin's River,* Blockhouse, Peter Langel's Farm, LUNENBURG, *Long Island, Cross Island,* Cross Roads by Church.

BRIDGEWATER DISTRICT:—Conrad's Farm, LaHave River, Rudolph's Mills, *Indian Brook,* New Germany L^{ake}

Conquerall Lake, Lapland Settlement, *Branch Lake*, Upper New Dublin, Publicover's Farm, Thrum Cap, Coet's Rocks, Mills's Village, Herring Cove, Bristol, Petite Rivière.

LIVERPOOL DISTRICT :—Herring Cove, East, Port Medway, Greenfield Bridge, Rossignol Lake, Brookfield, *Westfield Brook*, Beech Hill, Big Falls (Five Rivers), Broad River Bridge, Port Mouton, Robinson's Lake, Port Jolie, Sable River.

SHELBURNE DISTRICT :—Mount Nebo, Little Port Herbert, Green Hill, Sandy Point, Sable River, Lock's Island, Dixie's Hill, Kail's Point, Stokes Head, (?) Long Island Bridge, Himeon Hill, Ohio Church, McGill's Bridge, Indian Fields, Whetstone Lake, Welsh Village, Blue Mountains, Shelburne River.

BARRINGTON DISTRICT :—Clyde River (Second Branch), Lyle's Bridge, Cape Negro Bay, Upper Pubnico, Americibo Point, Double Islands, Port LaTour, Americibo, Spring's Field (Argyle), Porter's Hill.

TUSKET DISTRICT :—Kempville, Oakhill, Carleton River, Deer Valley, Hebron Corner, Temperance Lake.

YARMOUTH DISTRICT :—Lobster Shoals, Killam's Wharf, Bingay's Wharf, Cemetery Road, *Middle Jebogue*, Foot's Cove, Jebogue Point, Cranberry Head, *The Creampot*.

CLARE DISTRICT :—Avour's Head, Avour's Cove, The Caves, Sandy Cove, Cheticamp, Montegan Cove.

DIGBY DISTRICT :—Digby Neck, Bear River.

Gold was actually found in the localities printed in italics.

CHAPTER XXVIII.

REPORTS BY GOVERNMENT EXPLORERS : MR. CAMPBELL.

MR. J. Campbell, geologist, whose early researches led to most of the gold discoveries that have been made in the Province, was commissioned to visit the eastern counties, and the result of his observations is given in two elaborate reports to the Government, dated the 25th February, 1862, and the 25th February, 1863, respectively.

Mr. Campbell states that his investigations in 1861 were confined to a district lying south of a line extending eastward from Grand Lake by the valley of Upper Musquodoboit and St. Mary's Rivers, to the head of Chedabucto Bay—comprising an area of about three thousand square miles.

“The whole of the district is composed of strata more or less metamorphosed, consisting of clay slate, mica slate, talcose slate, and quartzite, interspersed with patches of rock so highly metamorphosed as to possess the true granitic character. Boulders from the granite, and sharp, angular masses from the quartzite and other silicified rocks, encumber extensive tracts of the country, giving it a rocky and barren appearance. The strata appear to have been plicated or folded, for in passing over the district I find a repetition instead of a succession of beds. Sections across the district at different points, show the general arrangement to be a succession of lines of elevation and lines of depression. The strata in broad bands dip alternately northward and southward at high angles, nearly vertical in

the lines of elevation, or anticlinal axes. The planes of bedding and the planes of slaty cleavage have a general line of strike, curving from S. 87° W., in the western end of the district, to S. 60° E. at its eastern end; but the strike of the cleavage planes does not appear everywhere to follow this course, for there are in some places two or three sets of cleavage planes cutting each other at acute angles, both in their lines of strike and dip, but sometimes in their dip only.

“ The strata throughout the whole of this district are cut by divisional planes, in the direction more or less of north and south. These planes are generally vertical, and cut the rock into large blocks or joints. Quartz veins frequently occur in these lines, but little or no gold has been found in them as yet in this district. The gold-bearing veins follow the planes of bedding in both their strike and dip, except when passing from one plane of bedding to another, which often occurs.

“ In almost every part of the district may be seen veins and lodes of quartz, from a few lines to several feet in thickness, but they are most numerous and have their finest development in bands along the lines that appear to be lines of elevation. *There appear to be five such bands or lines of elevation lying within a belt twenty-five or thirty miles in breadth.* They run nearly parallel with the general coast line, from Liscomb Harbor, westwardly as far as the Ovens, in the county of Lunenburg—a distance of one hundred and thirty miles—and eastwardly from Liscomb Harbor to White Haven—a distance of forty miles—within which they all, one after another, strike the shore. At several points in the axes of two of these bands, arched or folded strata are to be seen; which is conclusive evid-

ence of their being lines of elevation. The exact position of the other lines of elevation is defined by bands of strata more or less vertical, having their angles of dip decreasing both to the northward and southward.

" Mines have been opened at different points on the bands, that show arched or folded strata in their axes. The Ovens and Tangier Mines are on the band that lies nearest to the sea shore, and are eighty-five miles apart; yet no material difference is observable in the strata at either of these distant points. The mines opened at Isaac's Harbor and Laidlaw's Farm (Waverley) on the Truro road, are on the other of these bands, which is the fourth from the sea shore; and although they are over one hundred miles apart, yet the strata are the same in lithological character, at these two points; even the quartz lodes have a similarity of form, being ribbed or fluted in both places.

" The strata of the second band from the sea shore are also easily identified at Wine Harbor Mines and Lawrence-town Mines, which are eighty miles apart; for there are some coarse gritty beds in this band that may be readily recognised any where by a species of flaggy cleavage that gives them the appearance of gritty carboniferous shales. The third band from the sea shore can be identified anywhere by its thick-bedded vertical strata. Gold has been obtained from this band at Sherbrooke Mines, at the old Tangier diggings, and on the Salmon River in the Preston Settlement. The fifth band from the sea shore crosses Country Harbor at the Narrows, near Scott's Mills, where the strata are more talcose and micaceous than those of the other bands; but as this may be due to their close vicinity here to granite, it may not serve as a means of identifying them at other points, even but a few miles away from it."

"In the upper settlement of the Musquodoboit River, I obtained gold from veins in strata, closely resembling those at Country Harbor Narrows, but containing less talc and mica in their composition. This may, however, be on a sixth band, which there is reason to believe runs close to the southern margin of the carboniferous rocks that overlap the older group along their line of contact, and as they pass beneath them, unconformable in their stratification, it is not unlikely that they maintain their auriferous character for some distance north."

"Wherever I had an opportunity of examining the drift overlying those bands, I found it more or less auriferous. Between Spry Harbor and Sheet Harbor I observed several points where moderate wages could be made at placer washings. I found gold along the sea-shore the whole distance from Lawrencetown Harbor to where the Tangier band strikes Halifax Harbor, between Chobham Camp and Fort Clarence. It was at the latter point that I washed gold from the sand of the sea-shore in the year 1857, which, I have reason to believe, was the first gold discovered in the Province."

"The large quantity of gold found on the sea-shore between Cole Harbor and Fort Clarence is a sure indication of the existence of rich quartz veins in this part of the band. There is another point on the same band where the surface indications are of a very promising character; it extends eastward from Jeddore Harbor to Ship Harbor, a distance of ten miles. Broken quartz is plentifully distributed through the soil, and traces of gold were obtained from washings at a point near the post road, about five miles west from Ship Harbor. For some distance along this section, the rock is well covered with drift—chiefly

marine alluvium—but farther west, and near the Harbor of Jeddore, the surface of the rock is but slightly covered, so that the whole of the tract can be explored without much difficulty, and valuable discoveries may be confidently expected."

Mr. Campbell accompanied his second report with a section across the gold-bearing rocks of the Atlantic coast of Nova Scotia, illustrating the arrangement and relative position of the different groups of strata. We reproduce the section on a reduced scale in the frontispiece, and a portion of the report below.

"In all vertical sections hitherto made out across the rocks of the south or Atlantic coast of the province, but one line of elevation or anticlinal axis is represented along the centre of a band of strata over thirty miles in breadth."

"If this had, in reality, been the stratigraphical arrangement in the south coast band, there would exist but a poor chance of many of its older strata being brought to the surface in lines of upheaval along the north coast of the Province, where so great an accumulation of newer schistose and carboniferous rocks has taken place; for such an arrangement as one line of elevation in such a broad band of strata, dipping at an angle of sixty degrees on an average, would necessarily imply a vertical thickness of ten miles, at least, of beds."

"As it is, however, scarcely two miles, in vertical thickness, of beds are brought in section to the surface, for they are brought up in six different lines of elevation, or anticlinal axis, instead of one."

"By referring to the section appended to this report, it will be observed that the clay slate is superimposed on the

quartzite as a distinct group, and not interstratified with it in occasional bands, as is generally supposed."

"The quartzite should be regarded, therefore, as a distinct group also, being the oldest and thickest group of stratified rocks in the Province."

"Knowledge of these facts clears away much of the confusion in which the rocks of the south coast seem involved, and it renders exploration for gold, in every part of the Province, much easier and far more certain of success, since gold, in this country, appears to be mainly confined to the quartzite group, and to the lowest members of the clay slate group."

"The line along which the section is made out, extends from the sea-shore at the south-east entrance of Halifax Harbor, to the Renfrew Gold Field, a distance a little over thirty miles, intersecting in that distance no less than six great anticlinal folds."

"Those folds, or lines of elevation, run nearly parallel with each other, from the extreme western coast of the Province to the sea-shore, between Cape Canso and Liscomb Harbor, where they pass beneath the sea. This is owing to a curving of their course, or strike from east and west to south, sixty degrees east. In the western section of the Province, they also curve considerably to the south-westward."

"It will be observed that they do not lie at equal distances apart, which is due, no doubt, to the fact of the strata being folded up to sharper angles of inclination, or dip, in some of them. This is more particularly noticeable in the second line from the sea-shore, that passing through Citadel Hill."

"Whether the strata were folded in this manner previous

to their being hardened, or solidified, and whether a long period of time was occupied in the process of folding, are important questions, but not easily solved. The evidence, however, seems to preponderate in favor of the supposition that they were folded while undergoing the process of consolidation; and hence the formation of planes of slaty cleavage, and the peculiar grain or reed impressed on the strata, parallel to the direction of the axes of the folds. There is evidence also to show that these impressions were produced in lines horizontal in the direction of the axes of the folds."

"This is made sufficiently clear by the exact correspondence of the angle of the dip of the fibrous grain, with the angle of dip of the arched strata, in the crown of the axes of east and west lines of elevation, where they were broken transversely, and upheaved by north and south lines of disturbance."

"Indeed, it is mainly by observing the direction in which this fibrous grain of the rocks inclines, that the existence and position of transverse, or north and south lines of upheaval, can be made out, when the exposures in which the observations are to be made do not happen to be exactly on the axes of the folds; and the chances of finding such exposures along the axes of the lines of upheaval, very seldom occur, because the greater part of the surface of the country is covered by drift."

"To find the exact points at which the east and west anticlinal lines are intersected by north and south lines of upheaval, is of the utmost importance, for it is chiefly at such localities that gold bearing rocks are brought to the surface. This fact is worthy of particular notice, for it indicates, unmistakably, that gold is most abundant in the

quartzite group, and in the passage beds from it to the clay slate group. Nor is that the only point in this connection deserving the most careful attention; for if it is true that gold is most abundant in a zone lying at a great depth from what was the original surface of the clay slate group, previous to their being upheaved, transversely to the east and west parallel folds, and denuded, it follows that, from the axes of north and south lines of elevation, that zone will be found dipping at the same angle as the grain of the rock, either to the eastward or westward."

"Therefore the angle at which it must be followed, by drifting, is measurable, and the depth at which it can be reached, at any given distance from the axes of the transverse lines of elevation, is measurable also by carefully observing the angle at which the grain of the rock dips."

"The extent of denudation of strata of the clay, slate, and quartzite groups, in some localities, cannot be estimated at much below a mile and a-half of vertical depth; one-third part, at least, of this depth may be regarded as poor in gold-bearing quartz."

"There must, therefore, be extensive areas between the north and south lines of elevation, comparatively poor in gold. Those barren areas may be almost always known by a greater breadth of the surface being found occupied by clay slate, between the east and west anticlinal lines; and when gold occurs at all, in areas chiefly occupied by the clay slate group, it is necessarily confined to a narrow belt along the east and west anticlinal lines."

"As regards the gold removed from the rocks by denudation, and dispersed through the resulting detritus, it is possible that much of it may yet be discovered, if proper

search is made for it, in the direction in which it was removed from the matrix."

"In this country the direction of the denuding force appears to have been from N. 15 deg. W., to S. 15 deg. E. as a mean; there being slight deflections from this course observable in some districts."

"That the principal part of this abrasion occurred during the drift, or glacial period, does not admit of a doubt; therefore all the gold removed from the rocks must lie somewhere in the direction in which the glacier moved; and this direction can be ascertained, for any particular locality, by observing the direction of the polished grooves and scratches on the surface of the rock in place."

"In nearly all deposits of glacial drift, or boulder clay, on the south coast, more or less gold is found; but its economical value is much lessened by its dissemination through tenacious clay, too expensive to work by ordinary means. It is only where the glacial drift has been re-arranged that gold can be found sufficiently concentrated to make it worth working."

"The close vicinage to the sea of the gold-bearing rocks of the south coast renders it most likely that the greater part of the gold removed from the rocks by glacial action is now dispersed through the sub-marine banks skirting the southern coast of the province. Perhaps this is proved sufficiently clear by the fact of gold being largely disseminated through the sands of Sable Island, the only point of those banks above the surface of the sea."

"In the northern districts, it is most likely that the greater part of the gold liberated may still be found in the drift lying to the southward of those districts; and its presence in the sands of many of the rivers and brooks in

the interior, and along the northern coast of the province, may be regarded as reliable indications of its existence in some of those localities, both in the rocks and in the glacial drift. Those streams, in the greater part of their course, pass over carboniferous and silurian rocks, in which I failed to discover the existence of any gold; and not having sufficient time for examining the high land in which they take their rise, I was unable to discover the source from which they obtained it. That they carry it in their drift, from areas in which auriferous strata of the older clay slate and quartzite groups are brought to the surface, is most likely, and that it is obtained there, both from auriferous quartz veins and from glacial deposits, is also likely; but to explore thoroughly the whole of those extensive areas, much time, and most careful observation, will be required."

We have already freely quoted from Mr. Campbell's notes on the several districts visited on his tour of investigation, and as they contain many practical hints which will be of use to mining companies and explorers, we will endeavor to find room for them unabridged, but reclassified in the Appendix.

The reader is also referred to a graphic sketch of "The Secrets of Sable Island," by Dr. Bernard Gilpin, of Halifax, in Harper's Monthly Magazine for December, 1866.

CHAPTER XXIX.

VIEWS OF DISTINGUISHED FOREIGNERS: PROFESSOR JAMES W. TAYLOR'S REPORT.

THE United States Government, with a liberality which might well be imitated by the government of this country, in August, 1866, specially commissioned two celebrated scientists, J. Ross Browne and James W. Taylor, to report upon the mineral resources of the United States, an undertaking which Congress supported by a vote of twenty thousand dollars for their expenses, and an order for printing twenty-one thousand copies of the Report when completed. To Professor Browne was assigned the district west, to Professor Taylor the district east of the Rocky Mountains, the latter including Canada and Nova Scotia.

The impartial report from so eminent an authority cannot fail to interest all classes of readers, and the author therefore takes the liberty to transcribe the whole of that portion referring to the Gold Mines of this province :

"The gold fields of Nova Scotia consist of some ten or twelve districts, of quite limited area in themselves, but lying scattered along the south-eastern coast of the province. The whole of this coast, from Cape Sable on the west, to Cape Canso on the east, a distance of about two hundred and fifty miles, is bordered by a fringe of hard, slaty rocks, slates and stone in irregular alternations, sometimes argillaceous, and occasionally granitic. These rocks are always, when stratified, found standing in a high angle, sometimes almost vertical, and with a course in the main very nearly due east and west. They seldom rise to any

great elevation, the promontory of Aspatagon, about five hundred feet high, being the highest land on the Atlantic coast of the province. The general aspect of the shore is low, rocky, and desolate, strewn often with large boulders of granite or quartzite. This zone of metamorphic rock varies in width from six or eight miles at its eastern extremity to forty or fifty at its widest points, presenting in its northern boundary only a rude parallelism with its southern margin, and composing about six thousand square miles of surface, the general outline of what may, geologically speaking, be called the gold region of Nova Scotia.

A contributor to the Atlantic Monthly Magazine for May, 1864, enumerates Tangier Harbor, Wine Harbor, Sherbrooke, Ovens, Oldham, Waverley, Stormont, and Lake Loon, a small lake only five miles distant from Halifax, as localities which have fully determined the auriferous character of the district already described, and selects for specific description, and as a specimen of other veins, the Montague lode at Lake Loon. The course of this is E. 10 deg. N., that being the *strike* of the rocks by the compass in that particular district. It has been traced by surface digging a long distance, not less, probably, than half a mile. At one point on this line there is a shift or fault in the rocks, which has heaved the most productive portion of the vein about thirty-five feet to the north; but for the rest of the distance, so far as yet open, the whole lode remains true and undisturbed.

"Its dip with the rocks around it is almost vertical, say from 85° to 80° south. The vein is contained between walls of slate on both sides, and is a double or composite vein, being formed first, of the main leader; second, of a smaller vein on the other side, with a thin slate partition-wall between the two; and third, of a strongly mineralized slate foot-wall, which is in itself really a most valuable portion of the ore-channel.

"The quartz which composes these interposed sheets, thus separated, yet combined, is crystallized throughout, and highly mineralized; belonging, in fact, to the first class of quartz lodes recognized in all the general descriptions of the veins of this re-

gion. The associated minerals here are *cuprite* or yellow copper, green *malachite* or carbonate of copper, *mispickel* or arsenical pyrites, *zinc blende*, *sesquioxide of iron*, rich in gold, and also frequent 'sights' or visible masses of gold itself. The gold is also often visible to the naked eye in all the associated minerals, and particularly in the *mispickel* and *blende*.

"The main quartz vein of this interesting lode varies from three to ten inches in thickness at different points on the surface level, but is reported as increasing to twenty inches thick at the bottom of the shaft, already carried down to a depth of forty feet. This very considerable variation in thickness will be found to be owing to the folds or plications of the vein, to which we shall hereafter make more particular allusion.

"The minerals associated with the quartz in this vein, especially the *cuprite* and *mispickel*, are found most abundantly upon the foot-wall side, or underside of the quartz itself. The smaller accompanying vein before alluded to appears to be but a repetition of the larger one in all its essential characteristics, and is believed by the scientific examiners to be fully as well charged with gold. That this is likely to come up to a very remarkable standard of productiveness, perhaps more so than any known vein in the world, is to be inferred from the official statement in the *Royal Gazette* of Wednesday, January 20, 1864, published by authority at the chief gold commissioner's office in Halifax, in which the average yield of the Montague vein for the month of October, 1863, is given as 3 oz. 3 dwt. 4 gr.; for November, as 3 oz. 10 dwt. 13 gr.; and for December, as 5 oz. 9 dwt. 8 gr., to the ton of quartz crushed during these months respectively. Nor is the quartz of this vein the only trustworthy source of yield. The underlying slate is filled with bunches of *mispickel*, not distributed in a sheet or in any particular order, so far as yet observed, but developed throughout the slate, and varying in size from that of small nuts to many pounds in weight—masses of over fifty pounds having been frequently taken out. This peculiar mineral has always proved highly auriferous in this locality, and a careful search will rarely fail to detect 'sights' of the pre-

cious metal imbedded in its folds, or lying hidden between its crystalline plates.

"Nor is the surrounding mass of slate in which this vein is enclosed without abundant evidences of a highly auriferous character. Scales of gold are everywhere to be seen between its laminae, and when removed and subjected to the process of 'dressing' there can be little doubt of its also yielding a very handsome return. In fact, the entire mass of material, which is known to be auriferous, is not less than twelve to fifteen inches at the surface, and will doubtless be found, as all experience and analogy in the district have hitherto shewn to be the case, to increase very considerably with the increased depth, as the slate is not hard and easily permits the miner, in his progress, to bear in upon it without drilling upon the closer and more tenacious quartz.

"The open cut made by the original owners of the Montague property, and by which the veins have been in some degree exposed, absurd and culpable as it is as a mode of mining, has yet served a good purpose in showing in a very distinct manner the structure of these veins—a structure which is found to be on the whole very general in the province. The quartz is not found, as might naturally be supposed from its position among sedimentary rocks, lying in anything like a plain, even sheet of equal thickness. On the contrary, it is seen to be marked by folds or plications, occurring at tolerably regular intervals, and crossing the vein at an angle of 40° or 45° to the west. Similar folds may be produced in a sheet which is hung on a line, and then drawn at one of the lower corners. The cross-section of the vein is thus made to resemble somewhat the appearance of a chain of long links, the rolls or swells alternating with the plain spaces through its whole extent. Perhaps a better comparison is that of ripples or gentle waves as seen following each other on the ebb tide in a still time on the beach.

"The distribution of the gold in the mass of the quartz appears to be highly influenced by the peculiar wavy or folded structure. All the miners are agreed in the statement that the gold abounds most at the swells or highest points of the waves of rock, and

that the scarcely less valuable mispickel appears to follow the same law. The spaces between are not found to be so rich as these points of undulation, and this structure must explain the signal contrast in thickness and productiveness which is everywhere seen in sinking a shaft in this district. As the cutting passes through one of these swells the thickness of the vein at once increases, and again diminishes with equal certainty as the work proceeds; below this point it is destined again to go through similar alternations in its mass."

"The gold of Nova Scotia is remarkable for its great purity, it being on the average twenty-two carats fine as shewn by repeated assay. The bars or ingots are current in Halifax at \$20 an ounce. Assays by Professor Silliman, of Yale College, have ascertained values of \$19.97 and \$20.25, and the gold commissioner of Nova Scotia assumes \$19.50 as the basis of his calculations of the gold product of the province.

"The official returns of the deputy gold commissioners for the several districts to the chief commissioner at Halifax are unusually exact and reliable in regard to the most important point of the whole subject, namely, the average yield per ton of quartz crushed at the mills. By regulations of the mining department, every miner, or the agent or chief superintendent of each mine, is required, under penalty of forfeiting possession of the mine, to make a quarterly return of the amount of days' labor expended, the number of tons raised and crushed, and the quantity of gold. These returns are not likely to be exaggerated, as a government royalty of three per cent on the gross product is exacted. Besides the miner's report, all owners of quartz mills are also required to render official returns under oath, and in a form minutely prescribed by the provincial law, of all quartz crushed by them during each month, stating particularly from what mine it was raised, for whose account it has been crushed, and what was the exact quantity in ounces, pennyweights and grains. Upon this basis it appears that the average for all the mining districts is \$30 per ton; while the maximum yield at some of the prominent mines has been \$1000 per ton at Wine Harbor; \$240 at Sherbrooke, \$220 at Oldham, and \$100 at Stormont (Isaac's Harbor)

during the months of October, November and December, 1863. These results are independent of the great waste which attends the reduction of pyritous ores. The cost of reduction at this time does not exceed \$7 per ton, owing to the moderate scale of prices for labor, supplies and fuel in Nova Scotia.

"The writer in the *Atlantic Monthly*, already referred to, accounts for the absence of alluvial gold by the peninsular formation of Nova Scotia. The action of the glacial period would only transport the detritus of auriferous rocks beneath the Atlantic Ocean. Therefore, the gold of Nova Scotia is to be successfully sought under the application of the most scientific and systematic methods of *deep* quartz-mining. His summary of these methods is so suggestive that it will be cited :

"The ill-considered system of allotting small individual claims at first adopted by the colonial government, was founded probably, on a want of exact knowledge of the peculiar nature of the gold district, and the consequent expectation that the experiences of California and Australia in panning and washing were to be repeated here. This totally inapplicable system in a manner compelled the early single adventurers to abandon their claims as soon as the surface water began to accumulate in their little open pits or shallow levels, beyond the control of a single bucket or other such primitive contrivance for bailing. Even the more active and industrious digger soon found his own difficulties to accumulate just in proportion to his own superior measure of activity, since as soon as he carried his own excavation a foot or two deeper than his neighbors, he found that it only gave him the privilege of draining for the whole of the less enterprising diggers, whose pits had not been sunk to the same level as his own. Thus the adventurers who should ordinarily have been the most successful, were soon drowned out by the accumulated waters from the adjacent and sometimes abandoned claims. Nearly all of these efforts at individual mining are now discontinued, and the claims thus shown to be worthless in single hands have been consolidated in the large companies who alone possess the means to work them with unity and success."

"The present method of working the lodes, as now practised

in Nova Scotia, proceeds on a different plan. Shafts are sunk, at intervals of about three hundred feet, on the course of the lodes which it is proposed to work, as these are distinctly traced on the surface of the ground. When these shafts have been carried down to the depth of sixty feet, or, in miner's language ten fathoms, horizontal *drifts* or *levels* are pushed out from them, below the ground, and in either direction, still keeping on the course of the lode. While these subterranean levels are being thus extended, the shafts are again to be continued downwards, until the depth of twenty fathoms, or one hundred and twenty feet has been attained. A second and lower set of levels are then pushed out beneath, and parallel to the first named. At the depth of thirty fathoms, a third and still lower set of levels will extend beneath and parallel to the second. The work of sinking vertical shafts, and excavating horizontal levels to connect them, belongs to what is denominated the construction of the mine, and it is only after this has been completed that the work of mining proper can be said to begin.

"The removal of the ore, as conducted from the levels by which access to it has thus been gained, may be carried on either by 'direct' or by 'inverted grades'—that is, either by breaking it up from underneath, or down from overhead, in each of the levels which have now been described, or, as it is more commonly called in mining language, by 'understopping' or by 'overstopping.' When the breadth of the lode is equal to that of the level, it is perhaps not very material which plan be adopted. But when, as at Oldham, Montague, or Tangier, the lodes are only of moderate width, and much barren rock, however soft and yielding, has of necessity to be removed along with the ore, so as to give a free passage for the miner through the whole extent of the drifts, we shall easily understand that the working by inverted grades, or 'overstopping' is the only proper or feasible method. In this case, the blasts being all made from the roof, or 'back,' as it is called, of the drift, the barren or 'dead' rock, containing no gold, is left on the floor of the drift, and there is then only the labor and expense of bringing the valuable quartz itself, a much less amount in bulk, to the surface of

the ground. The accumulating mass of the dead rock underfoot will then be constantly raising the floor of the drift, and as constantly bringing the miners within convenient working distance of the receding roof. In the case of 'understopping,' however, in which the blasts are made from the floor of the drift, it will be perceived that all the rock which is moved, of whatever kind, must equally be brought to the surface, which entails much greater labor and expense in the hoisting; and gravity, moreover, instead of co-operating with, counteracts, it will be understood, the effective force of the powder."

There is quite a concurrence of testimony that the quartz seams increase in richness as they descend, although the excavations have not, as yet, been carried to depths exceeding three hundred feet.

The mining statistics of Nova Scotia exhibit very accurately the average yield per man, which in 1863 was 95 cents a day, in 1864, \$1.39, and in 1865, \$2.13. At the rate per diem last mentioned, each man employed produced \$684.80 per annum. The Australian estimates of the production per man of the mining population do not exceed an annual average, since 1851, of \$500.

"The value of gold produced in Nova Scotia during the year ending September 30, 1865, was \$509,080 (paying \$18,038 in rents and royalties); in 1864, \$400,440; in 1863, \$280,020; and in 1862, \$145,500. The earliest discovery of gold occurred in 1860. The productiveness of the mines was not diminished during 1866."

In a chapter on the Alleghany Gold Fields, Professor Taylor expresses the following noteworthy opinion :

"It can only be determined by a geological exploration, which shall embrace Lower Canada, Maine, New Brunswick, Nova Scotia and Newfoundland, whether the gold formation of Nova Scotia is associated with the Laurentian range, or is an extension of the auriferous belt which, first observed upon the Coosa river in Alabama, extends in a general northeast direction along the eastern flank of the Alleghanies to the Potomac river, with

some partial developments in Maryland, Pennsylvania, Vermont, and New Hampshire, and upon the Chaudière river of Lower Canada. In the latter case, the mining experience of Nova Scotia may yield valuable suggestions in regard to the auriferous lodes which are known to be very numerous in the talcose and chloritic schists of the southern Alleghanies. Since the California discovery of 1848, little attention has been given to alluvial mining in Virginia, the Carolinas and Georgia; and until recently, capitalists have acquiesced in the opinion, so confidently expressed by Sir Roderick Murchison in 'Siluria' and other publications, that, notwithstanding numerous filaments and traces of gold near their surface, the Alleghany veinstones held no body of ore downwards which would warrant deep quartz mining. At present, with twenty years' experience in gold mining; with the testimony of miners in Colorado that *a lode apparently closed by cap-rock can be recovered, with increased richness, at a lower depth*; with other analogies, however imperfect, from the successful treatment of pyritous ores in Nova Scotia, and with the earnest application of inventive minds to new and improved processes of desulphurization, it is evident that the working of the southern mines will be resumed, perhaps with the encouragement of a scientific survey under the auspices of the general government."

CHAPTER XXX.

VIEWS OF DISTINGUISHED FOREIGNERS: PROFESSOR SILLIMAN'S REPORTS.

Interesting as they would be we cannot afford space to reproduce *in extenso* the reports of Professor Silliman; but we cull from them some of the most important hints. In a report refuting the theory of the early exhaustion of the Nova Scotian Gold Mines, this learned philosopher employs the following emphatic language:

"There is no reason to fear that there will be any failure in depth in gold product or strength. The formation of the country is on too grand a scale geologically to admit of a doubt on this point."

Another passage contains the following sound advice to proprietors :

"You can now hold enough land in one connected stretch to justify deep mining. The policy of small areas is fatal to mining, and was conceived in a mistaken idea of the probable development of the region. Experience has shewn that large companies massing together considerable areas can alone hope to succeed. They will fail if they pursue a short-sighted hand-to-mouth system. There must be—

First.—A liberal supply of capital available for working the mine.

Second.—A wise forecast in laying out the work, and providing for an unfailing supply of ore for the machinery.

Third.—A well devised system of amalgamation that shall save the profits which a bad or indifferent system will lose. Stockholders will not be satisfied with dividends deposited in a sand-bank of 'tailings.'

Fourth.—A reasonable degree of patience in awaiting returns

"Many a valuable property has been destroyed by a neglect of one or more of these very obvious principles of a wise policy. To insure an early dividend a mine may be so effectually robbed by stripping it of all ore in sight and neglecting to push explorations well in advance of extraction, that the necessary result is the more effectual robbery of the owners, and this, too, without the mine being at fault.

"It is never to be forgotten that a well ordered mine is essentially a manufacturing business. A certain raw material, now valueless, is to become valuable by mechanical processes, and the same thrift, intelligent watchfulness of small savings, enterprise and forecast, are essential to success in it as in any other business. A cotton mill unprovided with raw material makes no profits, as many know to their cost. The cotton may exist in abundance, but if

it is not where we can put our hands upon it, it might as well not exist. Just so the ore in your mine. It becomes valuable only as you explore it and place it where the miller can be sure of a supply, with a good store accumulated to provide for accidents. If you will adopt these principles of action in mining, success is sure ; and even if your veins, from some unexplained cause, should ever give out, you will know it soon enough to search for new ones in other parts of your property, or for new developments of the old ones."

CHAPTER XXXI.

ENTIRE DEPENDENCE ON FOREIGN SUPPORT.

NEXT to the actual discoverers of Gold, there is no one who deserves more the thanks of the Nova Scotian public than Mr. Charles F. McClure, a capitalist of Boston, for his exertions to sustain and redeem the character of the Nova Scotian Gold Mines.

As one of the first owners of gold-mining property in the province, Mr. McClure, by his example, invited investments on the part of his countrymen ; and when, afterwards, swindling operators on the New York and Boston Exchanges did their utmost to depreciate the mines, and every cent of United States capital was recommended to be withdrawn, he stepped forward as their champion, and revived public confidence by investing still more largely in them himself.

The Ophir Company at Renfrew, the Mount Uniacke Company at Uniacke, the Hayden and Derby, the Palmerston, and the Wellington Companies at Sherbrooke, repre-

senting an aggregate of five million dollars capital, and contributing a minimum royalty of *one thousand dollars a month* to the provincial exchequer, are substantial proofs of his skill at organization as well as of his claims upon the public gratitude. Mr. McClure owes much of his success to having had considerable experience in California, which has enabled him invariably to make good selections for investment ; he has always paid a fair price, and always cash. He has never disposed of a property until thoroughly tested ; and if it did not answer his expectations would abandon it after spending, perhaps, thousands of dollars upon the experiment. For these reasons buyers and sellers deem it quite a privilege to deal with him ; and the different properties which he is now developing are justly rated with the choicest in the province.

After Mr McClure, Messrs. Oliver Brewster and Gilbert Attwood, wealthy merchants of Boston, have the largest pecuniary interest in and have done the most of any Americans, to promote bonâ fide and systematic gold mining in Nova Scotia.

The press of the United States has also greatly assisted in drawing attention to the capabilities of this country's gold mines ; especially the *Atlantic Monthly*, the *New York Sunday Mercury* and the *New York Times*. A quartennial statistical review, compiled with much care and labor from departmental records, which appeared in the latter, was afterwards published with the added results of a fifth year, in a tetraglot brochure by request of the Paris Exhibition Committee and also in tabular form for the Department of Mines, and under the title of Cosmopolite's Chart it has since been adopted, officially and by the public, as the most reliable standard of reference.

But while American enterprise more than any other has helped to develop the Gold Mines of Nova Scotia, a few Canadian financiers have also aided the introduction of working capital, and one of the most successful in that respect has been Mr. Carlos Pierce, owner of the celebrated Stanstead property on the Vermont border. Associated with Mr. Pierce is Mr. George B. Capel, the proprietor of the famous Capel copper mine, near Sherbrooke, Canada. The operations of these gentlemen have been very extensive. They initiated the prudent plan of consolidating small properties into one large block before placing them again in the market, a proceeding which greatly enhanced their value. The New York and Sherbrooke and the Dominion Companies at Sherbrooke, are instances of their successful enterprise.

A Mr. W. S. Hall, of Montreal, too, has contributed his part to stimulate Canadian interest. His operations have been recent, but so far eminently judicious.

New Brunswick is alone represented by Mr. Alexander Wright, a prominent merchant of St. John. -

CHAPTER XXXII.

HINDRANCES TO DEVELOPMENT.

The various causes which have retarded the development of the Nova Scotian Gold Mines may be classified as remediable and accidental. Under the former deserve to be enumerated :

1. The monopoly of the General Mining Association.
2. Native apathy of Nova Scotians.

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3. Inadequate Government support.
4. Incompetent representation abroad.
5. Limited publication of results.

And to the latter belong :

1. The war in the United States.
2. Disappointment in other gold fields.
3. Failures of badly managed Companies.
4. A mistaken system of allotment.
5. Swindling brokers and agents.
6. Proximity of the mines to commercial centres.

We propose devoting a chapter to the discussion of each.

CHAPTER XXXIII.

REMEDIABLE HINDRANCES TO DEVELOPMENT :

1. King George the Fourth of England, by patent of the 25th August, 1826, granted all the mineral lands in Nova Scotia to Frederick, Duke of York and Albany, for sixty years; and the Duke underleased his patent to certain creditors, John Bridge, Edmund Waller Rundell, Thomas Brigge and John Gawlor Ridge, of London, on the 12th September, 1826. The Duke died in January the following year, but letters of administration to the estate in England were not taken out until the 19th of February, 1840; and for this province not until the 27th May, 1851. Meanwhile the lessees already cited had formed a General Mining Association which received extraordinary concessions from the Provincial Government. An indenture of

1st January, 1858, afterwards limited their operations to certain districts, but the monopoly which this Association enjoyed tended not a little to check exploration.

2. A certain amount of lethargy is allowable in the dwellers under a northern climate, but the Nova Scotians are too apathetic. What other country with a thousand miles of coast, with some of the most capacious harbors in the world, and with a headland three hundred miles nearer than the rest of America, would content itself with only a fortnightly communication with Europe? What other capital, situated like this, would be satisfied after a whole century's existence with half paved streets, unpainted wooden houses, a dirty, untidy post-office, no parks, no markets, no theatres, no Polytechnic, no public library deserving the name, and *only one daily newspaper*? The Nova Scotians remind one of Goethe's phlegmatic, who, if a roasted pigeon flew to his mouth, would grumblingly decline it because it was not also carved.

At this date ninety-three per cent. of the capital invested in the exploitation of the Provincial Gold Mines, and eighty-seven per cent of that sunk in the Coal Mines has been supplied from abroad. A Bostonian—Mr. McClure—has spent a fortune in proving the capabilities of the former; a German—Mr. Bürkner—has produced the largest amount of gold from them; the United States press—the *Atlantic Monthly*, *New York Mercury* and *New York Times*—first drew attention to their importance; an alien—the author—prepared the first comprehensive statistical review of their production. But three of fifty or more Nova Scotian officials to whom the author addressed complimentary copies of that statistical review had the courtesy to return thanks for them; a foreign minister—

the Consul for the United States—not only politely acknowledged them, but embodied their substance in his own returns, since published by the Bureau of Statistics at Washington.

In July last the author offered to prepare, free of charge, a polyglot statistical review of the production of the latter for circulation at the Paris Exhibition, as there was much enquiry by foreigners for something of the kind, but the Exhibition Committee declined the proposal, and thus undoubtedly many valuable orders were lost. So that it is not the Gold Mines only which suffer from native neglect.

3. The Department of Mines is too limited in its staff and salaries. The Chief Commissioner is allowed about half as much as a bank manager or a confidential book-keeper; the Inspector of Mines gets only half the pay of a competent factory engineer; the Provincial Deputy Commissioner, who has four districts to look after as well as to prepare the returns of the office, is paid less than an estate steward, and the other deputies do not receive even journeyman's wages; there are but two clerks in the office, and several districts are without resident deputies.

The royalty imposed on the produce of the Mines is also an impediment which the Government might judiciously remove, or at least limit to the actual profits of the mine. These could be arrived at by sworn statements from the managers. The total abolition, however, of this tax upon industry, and the grant of land in fee simple, as in the United States, at five dollars per acre, would give an extraordinary impetus to mining adventure and bring in a larger revenue to the country than can ever be expected from royalty only.

The construction of good roads to the mines, a bridge

across Ship Harbor, telegraph lines to all districts, and steamboat communication along the coast, are works of immediate necessity that should be undertaken by the Government. The attendant expense would amply repay itself, by traffic and increased investment, in less than a year.

Nova Scotia has been nearly one hundred and twenty years under interrupted British rule, and Halifax during the whole period the principal military and naval station of British North America, yet it is not asserting too much to say that the educated classes in Europe are more familiar with the topography and resources of Japan than of this province. At least one-third of the country is still unexplored, and the want of a thorough geological survey is becoming daily more apparent. Its importance is admitted and its execution has been repeatedly urged by the local press. In the words of Professor Ashburner of San Francisco:

"A thorough survey of the various mining districts which are now attracting so much attention both at home and abroad, would confer incalculable benefit upon the country at large, and every means should be employed to bring before the public information of such a reliable nature that the capitalist may be guided in his investments, and the field of the prospector for new mines be restricted to those comparatively limited districts where there is any chance of his efforts being successful. Money and time uselessly expended in running prospecting tunnels, or in sinking shafts that can never be turned to any account, is so much loss of capital and labor taken from the productive industry, of the country at large."

But above all the government should be liberal toward discoverers and prospectors. The former especially are entitled to consideration.

The ridicule with which the early discoveries were received has already been in part described. Captain L'Es-trange was told that a broken pearl was worth more than his gold mine; Mr. Pulsiver was advised to go home and mend his old shoes; the Tangier Miners were informed that there was not gold enough in Nova Scotia to make a lady's thimble; and Messrs Campbell and Fraser were called 'damned insane visionaries' by a high placed but evidently low minded dignitary. There are officials in every country who decry new discoveries and inventions and everything that would turn public attention from their inflated selves to objects of real importance; who with Lord John Manners are ever ready to exclaim:

" Let laws and commerce, arts and science die,
But give us still our old pomposity."

It is such as these that retard a country's progress. The mine by them outvalued by a trashy pearl would be cheap to day at a million dollars; by possibly incurring a cobbler's bill one discoverer established a new and lucrative branch of industry; the visions of the 'insane' are becoming every day realized, and the gold already produced would not only make a thimble proportionate in size with Cleopatra's needle, but a bodkin for the needle too. Yet the scoffers sit in high places and are applauded for their wisdom: the instruments of the country's future greatness are unthought of and unrecompensed.

4. If the country had been properly represented at any of the late exhibitions, successively held at London, Dublin, and Paris, no better opportunity could have offered for making its resources universally known; but unfortunately the same commissioner was deputed on each occasion, and

he was neither a Nova Scotian, nor a linguist, nor a man of business. Parsons are *not* fit commercial agents, and if good for anything in their own sphere it is inconsistent with the sacred calling for them to subsist entirely by secular pursuits. Fine specimens of gold-bearing quartz and a gilt pyramid representing the bulk of gold mined in the province from the commencement, were sent to Paris, but without any description of the districts or the quantity contributed by each. The writer, aware of this omission, prepared the tetraglox statistical pamphlet, already alluded to, of which the Exhibition Committee accepted four thousand copies—at a price, though, which did not even cover the expense of publication. The Department of Mines subsequently ordered several thousand copies of an English chart and paid for them remuneratively. Without these aids the clerical commissioner could not of his own knowledge have answered a single question as to the comparative merits of each field, and the proportional yield of Nova Scotia contrasted with other countries.

5. The limited publication of the results of the Gold Mines is a reproach to the Government. The Royal Gazette in which the quarterly returns are published, has a very limited circulation, and the returns do not appear regularly or frequently enough. *We are now in the eleventh month of 1867, but not a single return for this year has yet been announced.* It is no excuse that, because the provincial deputy commissioner was sick, work should fall in arrear. Accountants fall sick in the Bank of England too, but the returns of that immense establishment are published punctually and with exactitude every week. An officer who has been afflicted with illness should not have arrears to bring up on his recovery; especially in such an important department.

The practice of depending entirely on one man in any service is a mistake, and a system of record could easily be introduced which would enable a temporary clerk to keep up the current work and prepare the monthly abstracts, with but very little instruction.

Successful operators like to keep the field to themselves; such as are unsuccessful do not care to proclaim their losses: investors therefore anxiously look for the publication of the Mines Department returns. On the necessity of their frequent issue and general distribution the author three years ago expressed himself as follows:

The natural advantages of a country, like the intellectual abilities of the scholar, and the wares of the merchant, require to become known before they can be appreciated. The best talents must remain unprofitable if always kept concealed, the most valuable merchandize will fail to obtain purchasers if no one knows where to seek it, and the mineral productions of Nova Scotia are merely held low in general estimation, and even ignored, on account of the imperfect attempts hitherto made to give them deserving publicity. The United States secured universal interest in their resources and a constant tide of immigration to develop those resources, not by works published only in English and at a comparatively high charge, but by the gratuitous distribution of pamphlets in every European language; not by occasional stale statistics in a journal whose circulation is limited almost exclusively to official circles, but by continuous fresh intelligence promulgated through the leading local and foreign newspapers, and by entertaining lectures in every continental city.

The Nova Scotian Government cannot be expected to act on so large or so liberal a scale, but there is still room to act as intelligently and as *earnestly*.

The Hon. Joseph Howe, Mr. P. S. Hamilton, and Mr. Joseph Outram, have each, under government auspices, published valuable information for the intending immigrant, but to enable their works to subserve the purpose for which they were written, their circulation should have been gratuitous, unlimited and universal.

The suggestive and important returns of the Mines Department at present published in the Royal Gazette, and briefly commented upon by the Halifax press, cannot enlighten the world outside of Nova Scotia unless that world sees them. The same remark may be applied to the annual report of the Chief Commissioner, of which not more than five hundred copies--if even so many,—are printed and given away.

Statistical tables are always dry reading except to the political economist, the merchant, or the accountant, while the same facts reduced to words, and their monotony varied by apt comparisons, would be intelligible and interesting to all. The labour and care bestowed upon the quarterly returns, their value and perspicuity, when set up in figures, can only be recognized by a practised or professional eye; alter their form, and their expressiveness will be multiplied a hundred fold.

While the Department of Mines does all and even more than could be expected of it, the Executive has not properly seconded this important branch of the public service.

But how second it? By a liberal provision for the most extensive publication; by advertising in full in words—not in figures—the results, *monthly*, in all the local and several of the most influential foreign journals, by forwarding circulars of the periodical returns to every scientific and mercantile institution of note, and by the free distribution of

twenty or thirty thousand copies of the annual report; and a portion of them in the most popular languages of Europe!

By such means, Nova Scotia would become *known*: in one year her reputation established. Publicity of a nation's resources is like advertising to the trader—the surest and most direct road to prosperity. There may be a touch of empiricism in the advice, but diffidence and indolence will never accomplish any good; and it is no reason that because the quack courts notoriety, the respectable physician should abstain from openly asking for practice while he needs it.

The people of Nova Scotia take their initiative from the Government, and so long as the latter is supine the former will continue apathetic. Emulation and energy are not so foreign to the soil as it is generally supposed—the seeds are not dead, they only require quickening.

CHAPTER XXXIV.

ACCIDENTAL HINDRANCES TO DEVELOPMENT.

1. The lamentable war in the United States occurring almost simultaneously with the discovery of gold in Nova Scotia, checked the introduction of capital, by diverting the attention of the only people capable of appreciating the mines, from foreign investment to domestic necessities. The support subsequently given by Haligonians to blockade-running and the abrogation of the reciprocity treaty soon after the restoration of peace, likewise contributed in no small measure to make Americans chary of extending their relations with this country.

2. Experience in California and Australia has taught

people that gold mining is no lottery : to be made profitable it requires the application of skill, method, and capital. The advantages of mining for gold, as a business, are that the returns increase in proportion to the amount invested, and the produce is always marketable ; but to suppose that gold can be had in the so-called gold fields for the mere trouble of stooping to pick it up, as in Tom Tiddler's Ground of childhood's memory, has been proved a fallacy long ago ; and many know it to their cost. There are still streaks in California, Australia, and Vancouver's Island, where a pick, shovel, and cradle, complete a mining outfit ; but NOVA SCOTIA IS ESSENTIALLY THE RICH MAN'S DIGGINGS. The mines of this country cannot be exploited without skilled labour and expensive machinery, and these cannot be procured without money. Plenty of pluck, endurance, and a vulcanized constitution, may enable the solitary miner, without capital, to eke out a living, and in some rare instances a competency ; but the best paying enterprizes, even in the older mining countries, are those in which the largest amount of capital has been judiciously invested.

The number of claims surrendered and forfeited here during the years 1862 and 1863, sufficiently prove that they were taken up by persons who had the extravagant notions that gold could be obtained without labour, and that nuggets must be as plentiful as pebbles after the sod had been removed. Several claims then abandoned as unprofitable, had had barely the surface scratched over, and now, under a new proprietary, are proving as rich as any in the colony ; as an instance of which may be cited the Beneficiary Company's Mines at Mooseland, Tangier.

Professor Ross Browne relates that in California " many

believed that there must be some volcanic source from which the gold had been thrown up and scattered over the hills, and they thought that if they could only find that place, they would have nothing to do but to shovel up the precious metal and load their mules with it. More than once, long trains of pack animals were sent out in the confident expectation that they would get loads of gold within a few days.

3. The same causes of failure which happened in California, have been repeated here. "Millions of dollars were invested in machinery, and superintendents, with the wildest ideas, were sent to erect mills and to take charge of the precious metals. In most instances the machinery was utterly useless and the superintendents were utterly incompetent." "Mills were built in places where only a little pocket of rich quartz had been found, and if the pay quartz was abundant it was not properly selected; or, if selected, the amalgamation was entrusted to a man who knew nothing of the business, and the gold was lost." The *American Journal of Mining* thus aptly depicts the mass of the Companies which have failed. "Shining examples of the penny-wise and pound-foolish. They had money enough to waste but none to spend. Heavy salaries to incompetent officers, large bonuses to speculative brokers, immense prices for undeveloped and worthless mines, were within their legitimate outlays, but such expensive things as thorough mining engineers, efficient business agents, upright and faithful lawyers, they could not afford to maintain." The Nova Scotia Land and Amalgamating Company, formed some few years ago in London, belonged to this class. In every district in the province, abandoned mills and mines are standing monuments of their squandered means and ill-directed energies.

4. The allotment of small areas also restricted operations, and even now the effects of the old system are felt where parties still hold on to their claims, unable to work them themselves, and yet unwilling to sell them on reasonable terms.

5. A very just cause of prejudice, however, has arisen through the operation of unprincipled speculators, both in England and America. Many properties, wholly unexplored, that were secured for a few dollars, have been disposed of, through false representations, for several hundred thousand dollars. It may be that some of these properties are *intrinsically* worth the sum paid for them, but in most cases the developments were imaginary, and the specimens upon which the sale was effected had been purchased at a jeweller's shop, or fraudulently obtained from a productive mine in another district.

Other cases have occurred in which the disposal of properties have been impeded through the exorbitant prices asked, and the extravagant promises made to shareholders, and as a case in point, we adduce the prospectus of the Ovens Gold Quartz Mines Company, limited, issued from offices at 134, Fenchurch Street, London.

1stly. The incorporation of the Company is dated the 25th of April, 1857, five years before gold mining commenced in the province.

2ndly. They ask £30,000 sterling for a property which, in its present condition, could be worked to advantage with as many thousand dollars.

3rdly. They pretend that two thousand five hundred shares have been applied for, yet after ten months waiting the proprietor has not received a sou.

4thly. They report an assay of 2646 oz. of gold and

136 oz. 4 dwts. of silver to the ton of quartz, from *working* samples.

5thly. They promise an average of from three to seven ounces.

6thly. They refer to the reports of survey held on the property by *thoroughly experienced* gold mining engineers.

Now the first report is from an engineer, but the second is from a Mr. W. M. Adams, a protégé and graduate of the Royal Naval Yard, and an absconding debtor, *who has never visited the Company's property at all.*

The report of Mr. Adams offers the following material for comment:—

1stly. He alleges that he had closely inspected many of the mining districts in the province, in which the mines were paying from 30 to 1000 per cent. dividends, and that there is no property calculated to pay better than that of the "Ovens" Company.

To obtain something better than a thousand per cent. would be a great inducement to invest in the "Ovens" Company; but, if as rich as represented, why part with the treasure at all!

2ndly. Mr. W. M. Adams has only visited three districts, Waverley, Oldham, and Renfrew, and those only on picnic excursions.

3rdly. Until Mr. W. M. Adams absconded from Halifax in March, 1866, he was only known as an ex-corporal of the Royal Engineers, and his present professional title of civil engineer, is but self-conferred, or, like his report, borrowed for the occasion.

6. A final cause specially affecting the progress of these mines, exists in the popular indifference to that which is

near at hand. National proverbs are generally good exponents of national antipathies, and the "Ce n'est pas de loin," of the Gaul, and the Teuton's "Das kommt nicht weit her," explain why distance, not in England only, lends enchantment to the view. Were Nova Scotia at the Antipodes, intense interest would be felt regarding her resources; but being within ten days' reach, they are not thought worthy of investigation, or even of passing notice.

CHAPTER XXXV.

METHODS OF REDUCING THE ORE.

IN California ninety-five per cent of the crushing is effected by stamp mills; in Nova Scotia the proportion is still larger; for here there is only one Chilian mill now in operation. The principle of the stamp mill is that of the pestle and mortar. A number of iron pestles, lifted successively by machinery, drop into an oblong trough or mortar upon the quartz, which is fed into it from an opening in front. The height of the fall varies from ten to eighteen inches, and the number of blows from fifty to eighty in a minute. It is calculated that each stamp should crush a ton of quartz of ordinary quality in twenty-four hours. The mills usually run day and night, except Sundays. The amount of quartz crushed depends to a considerable extent on the hardness of the rock, the weight of the stamp, the height of the fall, and the rapidity of the blows. In Nova Scotia, a battery or mortar generally consists of four stamps, in California of five or a multiple of five standing side by side in a row, but formerly placed in

a circle. An odd number is found to attract the ore towards the centre; with an even number the crushed particles are apt to accumulate in the corners by the outer stamps.

Until recently the stamps have been made of iron, but at the Ophir Company's mill at Renfrew, experiments have been tried with steel shoes and dies, which are found to wear at least four times as long although they barely cost twice as much as iron, and are therefore likely to be generally adopted.

The Chilian mill consists of massive wheels of granite, made to revolve edge-wise in a periphery in an iron pan upon broken pieces of quartz, which they reduce to the required fineness for amalgamation.

"The fineness," writes Professor Ross Browne, "to which the rock must be pulverized depends on circumstances. The particles of gold may be very fine, so that the quartz must be reduced to an impalpable powder before they can be liberated; but if the particles of gold and the grain of the rock are coarse, or if the pulp is to go through a grinding pan, the quartz may be allowed to escape when many of the particles are as coarse as sea sand, or even coarser. The battery has on one side a screen of wire-cloth or perforated sheet-iron, with apertures of the size of the largest particles that must be permitted to escape. A steady current of water runs through the battery, so as to carry away the quartz dust as soon as it is fine enough. The sheet-iron screens are punched with needles, and are known by the numbers. No. 7 screen is punched with a cambric needle, No. 3 with a darning needle."

"In Grass Valley most of the mills use Nos. 3 and 4 screens; elsewhere Nos. 4 and 5 and 6 are preferred."

"A multitude of crushers have been tried to break up the quartz before it is given to the stamps or other pulverizing apparatus, but the number in use is very small. Those principally in use consist of two heavy iron jaws, which are wide apart at the top and close together at the bottom, and as they work back and forth, the quartz is smashed between them. The quartz is usually in pieces not larger than goose eggs when delivered to the battery, and it is broken this size either by sledge hammers or by a large stamp, kept for the purpose of breaking up large stones."

"The musket-ball pulverizer has been tried as a substitute for stamps, and the report is favourable, but the trial has not been sufficient to command the confidence of miners. It is an iron barrel which revolves twenty-four times per minute on a longitudinal, horizontal axis. Inside of the barrel are a number of chilled iron balls, weighing an ounce each. The quartz is introduced in particles not larger than a grain of wheat, and in two hours it is reduced to an impalpable powder."

"Another pulverizer that has been tried, without attaining favour, is an iron star or wheel without a rim, which makes 1000 or 1500 revolutions per minute in an iron casing. The quartz is thrown with great force by the arms against the casing, and is dashed into fragments by the concussion. The casing is so made with little offsets, that the quartz strikes at right angles."

These novelties have not been tried in Nova Scotia. Experienced miners, here and elsewhere, still give the preference to the stamp mill of which the American Journal of Mining, in a recent issue, sums up the advantages in the following terms:—

1.—It gives a direct downward, accelerated blow. For all materials possessing high elasticity, this is the most effective method of pulverization. Grinding encounters all the resistance of hardness; but pounding avoids that contest. If one would pulverize glass, one does not rub it, one pounds it. Quartz, which is the most frequent substance crushed for metallurgical purposes, has great hardness and elasticity. It may be shivered by a blow, but it will resist a great deal of rubbing. The acceleration of gravity affords a simple method of regulating the force of the blow of the stamp by changing the height of its drop; and the free fall of the stamp relieves the machinery from all jarring—a point of vast importance, and one of the greatest difficulties which the inventors of direct-acting steam stamps will have to overcome.

2.—The repairs required by the stamp mill are few and simple, such as the common workman can understand and execute. A part of the machinery may be repaired while the rest is running as usual. In a large stamp mill there are often several stamps "hung up" but this does not interfere with the steady running of the mill. Any apparatus which must be stopped altogether for repairs, is liable to cause considerable delays and loss.

3.—The manipulations of a stamp mill are easy and plain. It is true that much skill is required to combine stamping with amalgamation; for instance, in the treatment of auriferous quartz; but that skill is exercised with the simplest means. Many machines which require skill to build them, keep them running, and repair them, do not admit of adjustment and relative change of their parts, and thus shut out skill entirely from its most important field. In the stamp mill, the speed, lift, weight, size and shape of stamps, the size and arrangement of discharge, the size and inclination of copper plates and screens, the arrangements for receiving tailings, and a dozen other elements, can be presented and combined with endless variations; and this is the field for skill.

4.—The material crushed receives the least possible handling, and in the case of auriferous quartz, is carried at once through the operation of amalgamation. There can be no improvement

in simplicity of the way in which crushed quartz, leaving the screens, passes over the amalgamating plates. We have seen workmen shovelling the pulp in a Bertola mill, or trying to suck it through a syphon in a Bullock mill, or blowing it up a flue with the Howell crusher, or hoisting it with elevators from Cornish rollers; but there is no machine or motive power cheaper than water running down hill; and that is what takes the ore out of a stamp battery.

5.—In the amalgamation of free gold, excessive working “destroys” the gold. There is no greater fallacy than the notion of reducing everything to “an impalpable powder” for amalgamation. Above all, this ought not to be done by rubbing. The gold as well as the quartz is thus reduced, and in the condition of fine dust or scales, gathering to itself a film of air, floats away on the surface of the water. It was the advice of an experienced amalgamator “don’t fool with your quartz a-getting of it fine; but the sooner you bring it to the quick, after you hit it the first blow, the less gold you’ll loose.” Tailings may be reduced to impalpable powder and concentrated; but a sieve with forty meshes to the inch, is fine enough for a first crushing. This result one can obtain with stamps more readily than with any grinding apparatus. As soon as the quartz is fine enough, it passes through the screens, without being subjected to further comminution.”

“These are among the reasons for our preference of stamps. They have great weight with practical men, and, until we see some well organized, systematic and successful use of the rival methods, we shall continue to believe that all our miners need is, not the invention of new crushers, but the careful construction, skillful adjustment, and faithful operation of such as we have already. We published last week a drawing of a ten-stamp battery of the latest pattern, built by Messrs. Morey & Sperry, of 95 Liberty Street, New York. Such machines are now crushing, annually, the quartz from which fifty millions of gold and silver are obtained, and in such, for the present, at least, we put our trust.”

A Mr. George H. Nissen, of Bergen, Norway, but lately resident in Nova Scotia, recently (October, 1867,) patented a mortar-box, which, it is claimed, saves more gold than any other appliance that can be used for the reduction of ores on a large scale by the milling process. A trial made with the same at the Orient Company's crusher at Wine Harbour, gave satisfactory results, but it has transpired that the invention was known at least two years ago in Colorado, and that Morey and Sperry's 'California Mill,' is similar in principle.

The New York Herald of this date (9th Nov., 1867,) refers to another invention, just in time to allow the quotation of an interesting paragraph, which is as follows:—

"According to the Nevada (Cal.) Transcript, perpetual motion is destined to be the salvation of quartz millers. That journal says, William C. Styles, of Nevada, has gone to Washington, for the purpose of securing a patent for a new mechanical power, which is destined to revolutionize the motion now used in machinery. By it a weight is made to act as the power to lift itself. Styles has been engaged on this machine for four or five years, and has managed it so secretly that even his most intimate friends could learn nothing of its nature. A short time before leaving, we are informed that the model was worked in the presence of one or more of our citizens, and one of them now offers to bet ten thousand dollars that Styles will accomplish what he has undertaken, and that the cost of running quartz mills and other machinery, when this invention is introduced, will be less than one-half what it is now."

Dr. J. C. Ayer, of Boston, claims to have discovered a

method of dissolving rocks and depositing the metals—but no experiments have yet been tried in this country.

A Colonel Stevens, of Brooklyn, has invented a flux which melts the quartz and leaves the gold as a sediment; but though the ingredients are said to be cheap, the furnace would be very expensive and the process itself attended with some danger.

Crook's and Dr. Wurz's patent sodium amalgam is highly spoken of by those who have tried it; but it requires specially fitted apparatus and skilful manipulation, in order to obtain the full benefit of its employment.

Professor Ashburner, of San Francisco, in his report of November, 1866, to U. S. Special Commissioner J. Ross Browne, very plainly indicates where improvements want to be made, in the following words: "By more thorough treatment *in the mill* there seems every reason to suppose that the yield could be largely increased. Experiments have been lately instituted—and they would appear to confirm this statement—most fully shewing that by more careful amalgamation the quartz, in some instances, can be made to yield from 50 to 140 per cent. more gold without a corresponding increase in the expense of treatment."

In proof that it is possible to increase the yield of very refractory gold-bearing ores by careful working and skilful treatment, Professor Ashburner, quoting from Whitney's *Metallic Wealth of the United States*, and the *London Mining Journal*, gives the following instance:—

"One of the oldest, and, when we consider the rebellious character of the ores, one of the most successful gold mines in the world, is that of St. John del Rey, in Brazil. The company now in possession has been in operation thirty-six years, and though, like nearly every other mining com-

pany, it has had its full share of ups and downs, the general results obtained have been most satisfactory to the shareholders, and it was only through the most careful, economical management, of both the mining and milling departments, that this end has been arrived at. There is no quartz mine in California which has ores in any quantity of so complex a nature or of so difficult a treatment as those of St. John del Rey. They consist principally of specular iron mixed with sulphuret of iron, magnetic pyrites and quartz. The auriferous mass at this mine is about forty-four feet in width, and, like most of the gold-bearing veins of California, dips with the rocks in the vicinity at an angle of about 45° to the southeast."

"The vertical depth upon which this deposit has been worked is now 1068 feet. Before the present company came into possession it had been worked for a hundred years, and was considered exhausted."

"The effective capital of the Company is £129,000, divided into 1100 shares, and there has been paid in dividends £756,245 or £68 15s. per share. There is on hand a reserve fund of £41,506, and the value of the property of the mine is estimated at £209,743, showing a total profit during the thirty-six years working of £1,007,494. The produce of the mine during this period has been £2,902,480, and the expenses £1,894,986 or 63.3 per cent. of the gross receipts. The average yield of the ore raised and treated has been at the rate of $4\frac{1}{2}$ oitavas per ton of 2240 lbs. This is equivalent to about \$8.50, or \$7.59 reduced to the usual California ton of 2000 lbs. The yield for the last three years has been as follows:—

1863,	\$10.94	per ton.
1864,	9.12	" "
1865,	10.36	" "

During this period, of the total amount of gold contained in the ore there was extracted the following per centage:

1863....72.35 per cent.

1864 ...75.52 " "

1865....77.95 " "

A practice of roasting quartz before putting it in the mill was in vogue in the early days of gold mining in Nova Scotia, but now it is entirely abandoned. The object was to destroy the sulphur, but it was found to vitrify the ore and render it both difficult of reduction and amalgamation.

The charge for crushing in custom mills has been as high in this Province as eight dollars per ton of 2000 pounds, but now it does not exceed three dollars, and the actual cost ranges from 60 to 90 cents. A good ten stamp mill can be built for four thousand dollars.

CHAPTER XXXVI.

ON MINERS.

A diversity of opinion seems to exist as to which miners are best adapted for this country. The provincials naturally prefer their own men; but the most successful companies allow that Cornishmen work faster and more economically. The number of skilled miners here is less than a hundred, or about one-seventh of the professed hands.

Miners' wages have varied little since gold mining began. The present rate is from \$1.10 to \$1.50 for pitmen; boys and carters receive from 75 cents to one dollar; and mechanics get from \$1.50 to \$2.00 a day.

Amalgamators are paid \$75 to \$100 per month; and mining captains, \$75 to \$150.

Board and lodging can be had at most of the diggings for \$3 or \$3.50 per week.

The real miners are a very orderly, industrious class; drunkenness, fighting, gambling and profanity are quite uncommon among them; and the gold stealers are generally black sheep more familiar with shot drill than drilling rocks.

The principal dangers to which miners are exposed are, the breaking of a rope or ladder when descending a shaft, the caving in of the hanging wall, the falling in of ore stacked too closely to the pit's mouth, and the premature ignition of the powder when tamping for a blast. The latter is the most frequent cause of accident, though it might be prevented by having a copper shield round the end of the steel rod, or tamper. Considering the careless state of many of the miners, there are comparatively few mishaps.

CHAPTER XXXVII.

GOLD LOST BY PILFERING.

GREAT complaints prevail of the impunity with which gold is stolen from the mines. The remedies which suggest themselves against that are :

1st. That men should not be engaged without a certificate of good character from some one known to the manager.

2nd. To retain a portion of their wages so that they could not leave without due notice.

3rd. To make the contractor responsible for men hired by him.

4th. To make the superintendent or whoever accepts the contract responsible to the proprietors of the mine.

5th. To have a clothing shed near the shaft where the men can be made to adopt a working dress, (to be supplied by the company) and be subjected to inspection as they go to and from the pit.

6th. To let all permanent hands receive a share, however small, direct from the profits of the mine.

7th. To establish better discipline and a code of by-laws.

The stolen gold has been disposed of, generally, to pedlars—the real instigators of the theft—but an act was passed last year which renders them liable to a penalty if caught within three miles of any mining district with gold in their possession. It is estimated that quite ten per cent. of the gold is pilfered below; and the fact is well corroborated that while the Tudor lode on Mr. Burkner's property at Waverley was being bared at its most productive part, a gang of twenty-four men at work upon it, massed their pickings and stealings together, and divided them equally at the end of each month, and the share *per man* for two months in succession amounted to over sixty dollars.

The law, therefore, might be made yet more stringent and only allow gold to be bought by the Deputy Commissioners, brokers, and jewellers on satisfactory legal proof that the seller had obtained it honestly.

A pedlar is now being held for trial who has had upwards of twelve hundred ounces of gold smelted for him at different periods within the last eighteen months, the whole of which is supposed to have been stolen. The miners, however, are

afraid to inform against him, and unless prosecuted by the Crown, for the royalty, it is feared that the fellow will escape justice.

CHAPTER XXXVIII.

ON MINING RECORDS.

THE importance of mining records has been brought to the notice of the Government in a very able pamphlet by Mr. John Rutherford, Provincial Inspector of Mines, and it is to be hoped that during the coming sessions of the Legislative Assembly some enactment will be passed rendering a clear and uniform system of record compulsory on the part all mine owners. The advantages which would accrue to science and to proprietors, are self-evident. The geological structure of every district would gradually be illustrated by the working plans of the different companies; and perhaps some rule in nature discovered, by comparison or induction, which would guide the gold miner or prospector in his operations.

CHAPTER XXXIX.

ABSTRACT OF MINING LAWS: ACT OF 1863.

THE early mining laws did not contemplate special provisions for the working for precious metals as proved by an abstract of the act of 4th day of April, A. D., 1863:

1. Applications for mining leases had to be made by petition to the Governor, who gave notice of the applica-

tion by an advertisement inserted for three months in the Royal Gazette.

2. If within twelve months from the publication of the notice the mines were not opened and worked, the Governor could grant a lease to the applicant.

3. When a mine had been abandoned for a period of twelve months, the Governor was empowered to lease it without notice by advertisement.

4. On complaint that a mine was not worked *bona fide*, but only colorably to prevent forfeiture, the owners could be sued in the Supreme Court, and if the charge was sustained, compelled to surrender the lease.

5. The royalties were not to be less than those paid by the General Mining Association; and no lease could extend beyond the year 1886.

CHAPTER XL.

ABSTRACT OF MINING LAWS : ORDERS OF COUNCIL.

THE discoveries of gold in 1860 and 1861, led to the adoption of special mining regulations for the Gold Fields, at a Council held at Government House, at Halifax, on the 15th day of June, 1861 :

1. Lots were limited to twenty feet east and west by fifty feet north and south.

2. Rents were fixed at twenty dollars annually per area, payable in advance.

3. A Commissioner was placed in charge of the mines on behalf of the Government.

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4. Licenses were not assignable without the consent of the Commissioner of Crown Lands.

5. The Local Commissioner was ordered to prepare weekly statistical returns.

6. A weekly mail by steamer was provided for.

7. Proprietors of soil were to receive four dollars for every area leased by the Government.

On the 4th September, an order of Council was issued for the Tangier district to the following effect:

1. Applications for leases covering one hundred and forty feet with the leads, and two hundred and fifty feet across the leads, must be accompanied by a payment of one hundred and sixty dollars, as the first year's rent, but after the first year, the rent, still at the same rate, to be paid half yearly in advance.

2. Reservation of roads and rights of way to be made in the leases.

3. The lease to contain a clause giving liberty to the Government, if they choose, to exchange the rent after the first year for a royalty of five per cent.

4. Lessees not to alienate, sub-let, or assign lots, or portions of lots, without the consent of the Government, on pain of forfeiture.

A later sitting on the 26th day of October, 1861, resulted in the subjoined minute in reference to the Owen's diggings:

1. The system of granting lots thirty by thirty-three feet, to be adhered to.

2. Larger areas, not to exceed three-fourths of an acre and five acres, allowed to be granted north of the base line.

3. Parties applying for such lots on private property to pay four hundred dollars for the same—one fourth on

making the application, one fourth in three months, and the residue as might be agreed upon.

4. A further instalment of twenty-five per cent to be paid on all claims taken previously to the adoption of this minute.

CHAPTER XLI.

ABSTRACT OF MINING LAWS: MODIFICATIONS.

THE regulations and orders of Council relating to Gold Fields were cancelled, and fixed laws substituted by enactments of the House of Assembly, passed on the 31st of March, 1862; the 31st March, 1863, and the 10th May, 1864, respectively.

The Act of 31st March, 1862, prescribed the size, rent, and number of day's labour for areas as follows:—

Class.	Size.	Yearly Rent.	Royalty.	Work
<i>Quartz Mines.</i>	<i>feet.</i>	<i>\$</i>	<i>Per Cent.</i>	<i>Days.</i>
1	150 × 250	40	Three	100
2	150 × 500	80	per cent.	200
3	300 × 500	160	when in	400
4	450 × 500	240	excess of	600
Alluvial Mines	1000 (square)	5	rent	Not stated.

A lease under the same could contain but one area.—Leases of alluvial mines were only issued for one year; those of quartz mines for twenty one years.

The Act of 1863, prescribed laws for regulating the management of quartz mills, which from the 1st of May, in that year, could not be worked without a license; re-

duced the rental for a number one area to \$10, which was afterwards to be deducted from the royalty ; allowed the inscription of five areas in one lease ; and provided for the issue of 'prospecting' licenses.

The Act of the 10th of May, 1864, known as the Chapter of Revised Statutes of Mines and Minerals, has now superseded all previous laws. It provides so many safeguards against fraudulent returns, and its general conditions are so fair and comprehensive, that even in its technical clothing, it will be read with interest, and is therefore inserted in full, in the Appendix.

The only legislation subsequent to the Act of 1864, having reference to the gold mines, is that already spoken of, which punishes pedlars hawking within three miles of a gold district ; and the compulsory enjoinder on mine owners to fence or board over all prospecting trenches of more than three feet in depth.

CHAPTER XLII.

SUGGESTED IMPROVEMENTS.

As the Gold Mines have become an acknowledged branch of industry and one of the main sources of revenue to the Province, it behoves the Government to foster them in every way by protecting the rights of honest miners and giving increased security and encouragement to investors. Among the improvements which suggest themselves or from time to time have been suggested to us, we enumerate the following, though some of them have been already noticed :

1. In order to test the depth to which quartz mining may be extended, the Government might meet half the expense of carrying down a shaft to eight hundred feet; the other half being borne by the principal Gold Mine proprietors in the Province. The deepest shaft yet sunk is 300 feet at Sherbrooke on the "Grape Vine Lode," and the next deepest is at Waverley on the Tudor Lode. Either of these could be taken up where the work has stopped, and thus the problem solved whether deep mining will pay in this country.

The deepest mine in the Brazils is eighteen hundred feet in perpendicular depth; in Australia several companies are working at fourteen hundred feet; in California the Kearsage mine has yielded as high as \$800 to the ton from the depth of twelve hundred feet; the richest portion of the Eureka mine, at Sutter Creek, Amador Co., California, as stated by Professor Ashburner, appeared to be at a depth of between 1000 and 1100 feet, where the quartz is said to have yielded \$30 a ton; and the Silver Mines in the Hartz Mountains, Germany, have reached a depth of over 3,200 feet. Professor J. W. Taylor, in his report to the Secretary of the U. S. Treasury, cites an instance that occurred in Colorado where "it became necessary to traverse the cap rock, often 150 feet deep, but at length the indurated pyritous ore was reached, *very productive of gold*; and the testimony is quite general that the mine widens and grows more productive of gold at its lower stages."

Now, with such an accumulation of evidence in its favour, the prosecuting a deep search in this country is no lottery, but rather a duty owing to science and investors; it is more than probable that good paying ore would be met with in the descent which would cover the whole cost of

the experiment; and, even, if it did not, the knowledge to what depth the quartz veins may be *safely* followed is one of such pressing importance that it can hardly be too dearly purchased.

2. To abolish royalty, and sell the land in fee simple; or exact royalty from net profits, only.

3. To credit mine owners with the full amount of work executed by them in the Province. A mine owner may have several interests in one field; or in different districts, one of which, only, may call for his preference or attention, and though upon that one he may have performed one hundred times more labour than was necessary, he is still liable for a certain amount of work for each other area not in the same lease. Again, one year a company's means may be absorbed in erecting machinery, buildings, dams, &c., and other dead work; and yet the excess of labour beyond the statute requirements will not be taken into consideration in the next year's account with the Department.

4. To hold an immediate geological survey.

5. To repair roads and establish telegraph lines.

6. To have a steamer running as far as Sheet Harbor, east; and The Ovens, west.

7. Not to issue a prospecting license for private lands, until the owner has had fourteen days, notice of the application.

8. Not to issue a receipt for mining leases on private lands, until the applicant can show the owner's consent.

9. To encourage prospecting and substantially reward discoverers. The single free claim is often no better than a white elephant.

10. To abolish all small areas.

11. To have lithographed maps for each district.
12. To appoint a registrar in every proclaimed district; and in the unproclaimed to have, always, an acting deputy commissioner.
13. To publish statistics regularly and frequently.
14. To modify the form of the statistics so as to give fuller information.
15. To compel mining records.
16. To increase the staff of the Mines Department.
17. To raise the pay of its Officers.
18. To institute fees for search or enquiry at the Mines Department Offices.
19. To establish a Geological Museum.
20. To purchase the best quartz specimens that may be found, and to preserve them in the country.
21. To license mining brokers.
22. To engage the Professors of Geology at the Provincial Colleges occasionally to visit and report upon the districts.

CHAPTER XLIII.

STATISTICS: GROSS YIELD OF GOLD.

THE returns of the gold product for 1860 and 1861 were rendered to the Commissioner for Crown Lands, and a distinct Department of Mines not created until 1862. Even then it took some time to establish a system of record, and little reliance can be placed upon the accounts, for the purpose of averaging or comparing, for any date previous to July, 1863.

Very little of the gold obtained in 1860 and 1861 was reported at all; and in conversation with some of the pioneer miners and ex-Gold Commissioners we have ascertained the fact that at least six thousand ounces were raised and disposed of during that period. The gross yield for the Province, then, from May 1860 to 31st December, 1866, would read in round numbers as follows:—

Year.	From Quartz only. Ozs.	Native Gold. Ozs.	Total. Ozs.
1860 }			
1861 }	4000	2000	6000
1862.....	6964	311	7275
1863.....	13973½	28	14001½
1864.....	19936½	86½	20023
1865.....	25341½	112½	25454½
1866.....	25155½	49	25204½
1860-66.....	95871	2587½	97958½

Which gives an approximate value of one million, nine hundred and nine thousand, one hundred and sixty dollars. The proportions for each district for the same period stands thus:

District.	From Quartz only. Ozs.	Native Gold. Ozs.	Total. Ozs.
Waverley.....	34364½	....	34364½
Sherbrooke.....	19068½	38	19101½
Wine Harbor.....	13402	....	13402
Renfrew.....	9898	....	9898
Isaac's Harbor.....	6656	....	6656
Oldham.....	5207½	....	5207½
Tangier.....	3058	399½	3457½
Montague.....	2819	....	2819
Ovens.....	281½	2011	2292½
Unclassified.....	268	89	357
Lawrencetown.....	190	50	240
Country Harbor.....	90	....	90
Uniacke.....	73	....	73
. Total.....	95371	2587½	97958½

The estimated yield for 1867 is twenty-seven thousand ounces, which, with the product of former years, would

represent about *three tons* of the precious metal, a weighty, if not conclusive argument of its prolific existence in the soil of Nova Scotia.

CHAPTER XLIV.

STATISTICS: MAXIMUM PER TON.

By a *partial* selection of the quartz it is possible to produce a very large proportionate yield, but the practice is not considered fair, and occurs very rarely. The maximum per ton is generally calculated from the average crushings, and not from any choice or selected lots.

The maximum per ton of 2,240 lbs. during the years 1862 to 1866, for each district reads as follows:

	ozs.	dwt.	grs.
Sherbrooke.....	146	8	19
Oldham.....	116	2	21
Wine Harbor.....	73	18	9
Waverley.....	22	15	20
Unclassified.....	12	0	0
Lawrencetown.....	10	1	14
Tangier.....	10	9	7
Uniacke.....	10	0	0
Renfrew.....	9	18	0
Isaac's Harbor.....	9	11	5
Montague.....	6	2	11
Country Harbor.....	5	10	13
Ovens.....	2	4	20

Sherbrooke, therefore, has the distinction of having yielded *the* maximum; but it should be noted that, for that district and Oldham, the quantity of ore crushed from which such high returns were made was, in each case, only four hundred-weight, and that the yield was calculated in

proportion only to the ton. The maximum returned for the other districts is from the actual crushing of several tons.

The occurrence of gold in pockets, or rich streaks, is not usually considered a favourable indication of the continuity of the vein, but still, occasional large deposits are always welcomed.

CHAPTER XLV.

STATISTICS: AVERAGE YIELD PER TON.

THE sustained average yield per ton from the crushings of ninety thousand, eight hundred and fifty-eight tons of ore was one ounce and three grains, the proportion for each district rating thus:

<i>District.</i>	Quartz crushed 100 lbs.	Per 100 lbs of Quartz. <i>Grains.</i>
Uniacke.....	570	61.3211
Montague.....	33662	40.1992
Country Harbor.....	480	40.0000
Sherbrooke.....	247068	34.8987
Isaac's Harbor.....	93079	33.0356
Renfrew.....	178103	26.1368
Lawrencetown.....	2970	22.6070
Wine Harbor.....	287512	21.1225
Tangier.....	69829	18.9586
Oldham.....	131015	18.7132
Ovens.....	3381	18.6567
Divers.....	7478	17.2072
Waverley.....	980055	16.3165
Total... ..	2,035,202	Mean.....21.5497

The average would be still higher were the results from pure quartz and from quartz and slate noted separately. As it is, no other gold district in the world yields its quartz so easily and in such proportion.

CHAPTER XLVI.

STATISTICS: AVERAGE YIELD PER MAN.

THE profitability of any pursuit can only be estimated from the average earnings of all engaged in it; and, although in order strictly to follow out the rule, in its application to Gold Mining, it would be necessary to include the officers: the proportion to each miner is not an uncommon, or an unsafe method of average.

The actual quinquennial mean for 1862 to 1866, was \$517.32; the triennial mean for 1864 to 1866, \$680.90; and the biennial mean for 1865 to 1866, \$744.16. The mean for each district, and the number sharing therein, were as under:—

Miners. Gross No.	District.	Annual Average per man. \$ c.
181,794	Sherbrooke.....	852.60
99,866	Wine Harbor.....	790.52
96,928	Renfrew	624.32
79,496	Waverley.....	547.72
89,856	Isaac's Harbor.....	444.84
1,326	Uniacke	342.64
97,888	Oldham	325.72
3,120	Lawrencetown.....	279.72
936	Country Harbor.....	265.80
10,426	Ovens.....	264.72
68,588	Montague.....	256.48
11,882	Unclassified.....	187.52
115,050	Tangier.....	157.68
<u>1,107,106</u>	The Province.....	<u>517.32</u>

In reviewing this table, it should be borne in mind that much gold has been lost, and much not reported; and that with economical and well applied labour the production per man for every district could be considerably increased, in some cases even doubled.

CHAPTER XLVII.

STATISTICS: NUMBER OF MINERS.

THE number of miners employed in a district does not always bespeak its prosperity, although here—except at Tangier after the first discovery of gold—there have been no ‘rushes’ or spasmodic migrating from one district to another. This is in part explained by the fact that few miners work on their own account, and consequently follow the fortunes, or rather the caprices, of investors. It would be an interesting as well as important item of information, to ascertain with exactness how many independent miners there are in the country; and how many working for wages. One seventh, or about one hundred in the aggregate, probably, would include the whole of the former; but there are difficulties in the way of procuring precise details.

The average daily number of miners for each year since the opening of the gold mines is thus recorded:—

Year.	Daily number of Miners.	Quartz raised per man.
1860-1	414	85.5
1862	500	86.4
1863	877	124.3
1864	810	169.6
1865	683	234.8
1866	679	300.0

and shows that with a decreasing number employed, the results yearly increased; and that not on account of richer deposits, but of a gradually improved system of mining.

CHAPTER XLVIII.

COMPARISON WITH AUSTRALIA AND CALIFORNIA.

THE subjoined data are compiled from official records and impartially illustrate the capabilities of Nova Scotia:

AVERAGE ANNUAL EARNINGS PER MINERS.

Year.	Victoria, Australia.	Nova Scotia.
	\$ c.	\$ c.
1860	397.31	290.00
1861	373.97	292.00
1862	339.27	319.28
1863	352.35	494.36
1864	370.44	745.76
1865	371.04	742.56
1866	402.06	

Even by separating the returns of quartz mines from those of alluvial mines, this Province benefits by a triennial contrast, as shown below:

Year.	Victoria, Australia.		Nova Scotia.	
	QuartzMiners	Annual Earnings.	QuartzMiners	Annual Earnings.
	No.	\$ c.	No.	\$ c.
1864	15414	663.63	810	494.36
1865	17730	507.71	688	745.76
1866	15685	664.35	679	742.56
Mean	16276	608.47	724	660.89

The average yield per ton and per man for one year—take for instance 1865—will also tell in favour of Nova Scotia.

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	Average <i>daily</i> .	Average			Annual	
	No. of Miners.	per ton.			Aver. per man	
	No.	oz. dwt. gr.			\$	c.
Waverley.....	280	1	5	18.6	1029	45
Isaac's Harbor.....	81	1	16	12.9	417	52
Sherbrooke.....	74	1	10	12.9	928	56
Oldham.....	58		11	6.8	384	56
Wine Harbor.....	53		12	20.6	827	65
Renfrew.....	46	1	4	8.8	435	20
Tangier.....	42		19	4.1	305	60
Montague.....	40	1	12	13.4	455	12
Unclassified.....	8		6	17.5	119	16
Mean for the whole } Province of Nova S. }	683	1	3	5.8	747	76
Mean for Victoria, } Australia, excluding } Alluvial Miners..... }	17730		11	17.4	507	71
Mean for do, includ- } ing Miners of all } classes..... }	83214				371	04

There are no returns at hand to enable one to institute a comparison with California, but Professor Ashburner considers (*vide* Report to U. S. Commissioner, J. Ross Browne, on the Gold Mining Interest of California), that the average earnings per miner are not greater there than in Australia.

In its average per ton Nova Scotia invites comparison with other countries. For example :

The average for California is fifteen penny weights; the average for the St. John del Rey (Brazils) eight penny weights; and for the Ural mines only two penny weights; while Victoria and Nova Scotia compare as follows :

Year.	Victoria, Australia.			Nova Scotia.		
	oz. dwt. gr.			oz. dwt. gr.		
1864	10	6.9		1	0	20
1865	11	17.4		1	3	6
1866	10	16.2			17	18
Mean 1864-66	10	19.2		1	0	18

COMPARISON WITH AUSTRALIA AND CALIFORNIA. 135

Victoria, in 1865, employed daily one hundred and twenty two (121.8) times as many miners as Nova Scotia, that is, as many in two days and a half as this Province did during the whole year; but it produced only sixty and six tenths as much gold; and although thirty eight and a half times as many mills were in operation there they only crushed thirty two times as much ore.

The cost of crushing and mill treatment will be most intelligible when placed in tabular form, which is done below.

	From.	To.	Authority.
	\$ c.	\$ c.	
Victoria.....	1 0	7 50	Secretary for Mines.
California.....	0 67	8 31	Professor Ashburner.
Do	0 75	7 00	Professor Rémond.
Nova Scotia.....	0 50	8 50	Mining Companies' Returns.

The cost of raising a ton in Australia is not shown in the Government Report; but for California and this Province we have the following estimates:

	Minimum.	Maximum.	Authority.
	\$ c.	\$ c.	
California.....	2 00	26 00	Professor Ashburner
Do	1 00	10 00	Professor Rémond.
Nova Scotia.....	1 00	30 00	Mine Owners' Returns.

The wages in Australia vary from \$2 to \$3.50; in California from \$3.50 to \$5.00, but according to late reports the miners in the latter country have struck for \$6.00. The maximum paid in Nova Scotia is \$1.50; and \$1.25 is the general average.

CHAPTER XLIX.

ADVANTAGES OF NOVA SCOTIA AS A MINING COUNTRY.

NOVA SCOTIA offers the following inducements and facilities for mining enterprise :

- 1st. It possesses an inexhaustible supply of minerals.
- 2nd. Labour is cheap and can always be procured in proportion to the demand.
- 3rd. Water, fuel and provisions are plentiful and inexpensive.
- 4th. The climate offers no obstacles to continuous mining operations.
- 5th. Attacks from venomous reptiles, savage beasts, or treacherous Indians never disturb or impede settlement.
- 6th. Fatal epidemics, agues and pestilential fevers are unknown.
- 7th. The country is within thirty hours' steaming distance from Boston and ten days from Europe.
- 8th. The voyage costs one-fourth less than to California, and one-sixth less than to Australia.
- 9th. The laws are just, they encourage legitimate adventure, and are likely to undergo further liberal modifications.
- 10th. The expenses of mining are less, and the profits, on the average, greater than in other countries.

Advantages like these need no comment ; they are facts which cannot be controverted and which, before long, will be universally admitted.

CHAPTER L.

ITINERARY.

THE tourist must not expect the comforts of an English stage coach or a German Eilwagen in posting through this Province. Railroad travelling is all very well, but the conveyances called stages, are dirty, jolting and unsafe. The roads too, in some districts, are so rough and stony, that it is a punishment to ride over them, and it is therefore useless for the traveller to bring any encumbrances with him. The cost of a thirty days' tour, embracing every district, ought not to exceed \$250, and by studying economy, it can be completed for less. We submit a programme which may be of convenience to the reader.

Montague.—By ferry to Dartmouth, thence by chaise; spend the day at the diggings and return to Halifax by same route. A chaise might be hired in the city lest there should be a difficulty in obtaining one at Dartmouth.

Lawrencetown.—By ferry to Dartmouth, and by chaise *via* Cole Harbor to Lawrencetown. Take lunch with you or dine at a farm house in the village.

Waverley.—By rail to Rocky Lake station, thence by stage, or hired chaise; dine in the village and drive back through Dartmouth.

Uniacke.—Take Windsor train; debark at Uniacke; there take stage. Accommodation at the diggings.

Renfrew.—Take Truro train; debark at Enfield; take chaise to diggings; stay overnight at Bunker's hotel.

Oldham.—Take stage to station; cross the line; take another stage there for Oldham, or walk, the distance being

only three miles. Good hotel. Leave in time to catch down train for Halifax.

Gay's River.—Take train to Shubenacadie; hire chaise at the Union (Nelson's); drive to Corbett's; look around; bait horse, and get refreshment at a farm house, and return in time for down train.

Tangier.—Take Archibald's stage at Halifax, which completes the journey in one day. Spend next day at Mines in Tangier Harbor. Stop at Leary's Hotel.

Old Tangier.—Hire horse at Tangier Harbor, and bear up for Mooseland. The distance is a little over twelve miles, but will occupy several hours to accomplish. Return the same day to the Harbor and next morning take the stage back to Halifax.

Chezzetcook.—Break your journey when returning from Tangier at this place, and after visiting Captain Gregory's mines, return the following day by stage or chaise to Halifax.

The Ovens.—Take King's stage, (although the worst in the province,) through to Lunenburg. Rest at King's Hotel, one of the neatest in the province, and next day hire a sail-boat to cross over to Spindler's Cove; walk the remaining distance, about a mile and a half; visit the Ovens, lunch, and return to boat; or if disposed to stay a day or two to pan gold and explore, there is excellent accommodation at Macdonald's, where information concerning the field will also be cheerfully given.

Gold River.—When tired of Lunenburg and the Ovens, hire a chaise to the head of Chester Basin, stay over night at Lantz's, next morning drive over to Gold River by chaise; return at night to the Basin, and the next morning stop the stage on its way through to Halifax.

Sherbrooke.—Take the train to New Glasgow, proceed thence by stage. The journey occupies about sixteen hours. Stay at the Sherbrooke House, kept by Captain McDaniel. Next morning ferry over the St. Mary's river; take stage or walk to Goldenville. Visit mines; dine at Rockville; and return by same route in the evening.

Wine Harbor.—Hire a chaise from Sherbrooke proper. Put up at Thompson's, or at the Brooklyn House, Sonora, which you will notice on your way through. Spend what time you can spare and return by same route.

Isaac's Harbor.—Engage a chaise and guide at Sherbrooke to carry you through to Isaac's Harbor. The journey will occupy about nine hours. You may procure rooms at Captain Taylor's. It will take two days to visit the mines in both divisions. Return by same route and break your drive at

Country Harbor.—Where, if disposed to remain, you can be accommodated at one of the neighboring farm houses. Should you have only a valise there is no occasion to return all the way to Sherbrooke, but you can stop at Melrose at the Eleven Mile House, and from there next morning take the stage and train back to the metropolis.

Stewiacke.—May be reached by train as far as Brookfield, where it will be necessary to hire a conveyance. The journey, there and back, can be completed in one day; but in doing so one would hardly have time to look round.

Hammond's Plains.—Are within easy drive of the city, allowing three hours for inspection, the trip would only require eight hours to accomplish.

Middle River.—The route to this district has been already described and the journey cannot easily be performed under eight days.

Travellers who can afford it, will do well to avoid the stages and always hire a chaise where there is a possibility of procuring one. The actual time required for a hurried visit would be as follows:

District.	Days en Route. (Double Journey.)	Visit. (Days.)	Total. Days.
Montague.....	$\frac{1}{2}$	$\frac{1}{2}$	1
Lawrencetown.....	$\frac{1}{2}$	$\frac{1}{2}$	1
Waverley.....	$\frac{1}{2}$	$1\frac{1}{2}$	2
Unlace.....	$\frac{1}{2}$	$\frac{1}{2}$	1
Renfrew.....	$\frac{1}{2}$	$1\frac{1}{2}$	2
Oldham.....	$\frac{1}{2}$	$\frac{1}{2}$	1
Gay's River.....	$\frac{1}{2}$	$\frac{1}{2}$	1
Tangier.....	2	1	3
Old Tangier.....	$\frac{1}{2}$	$\frac{1}{2}$	1
Chezzetcook.....	$\frac{1}{2}$	$1\frac{1}{2}$	2
Ovens.....	2	$1\frac{1}{2}$	$3\frac{1}{2}$
Gold River.....	$\frac{1}{2}$	1	$1\frac{1}{2}$
Sherbrooke.....	2	3	5
Wine Harbor.....	1	2	3
Isaac's Harbor.....	2	2	4
Country Harbor.....	2	1	3
Stewiacke.....	1	1	2
Hammond's Plains.....	$\frac{1}{2}$	$\frac{1}{2}$	1
Middle River.....	6	2	8
	<u>$23\frac{1}{2}$</u>	<u>$22\frac{1}{2}$</u>	<u>46</u>

CHAPTER LI.

ADDRESS TO THE READER.

WITH the exception of those persons actually engaged or pecuniarily interested in their development, few were aware of the existence or productiveness of the Gold Mines of Nova Scotia, until this summer, when the local Government distributed several thousand copies of the author's

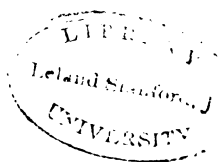
Statistical Chart and Reviews of their yield from 1862 to 1866.

Enquiries are now being made from different parts of the world as to the location and means of access to these Mines, and, in the absence of any book containing information of the kind required, the author has been induced to undertake the supererogatory task of preparing this Guide in the hope that it will answer a temporary purpose and incite scientific research and legitimate enterprise.

The tables, as any statistician will understand, were not the work of a few days or even a few months, but the descriptive portion of the book, which the author is aware contains many defects, has been written amid frequent interruptions and harassings in the space of less than four weeks. The reader, therefore, is requested to be lenient in his criticism of this edition, as a new one, illustrated and carefully revised, will be issued during the coming spring.

The author would be ungrateful did he not here publicly express his great obligations to the officials of the Mines Department for facilities accorded in obtaining data; to the Honorable Mortimer M. Jackson, Consul for the United States, for a valuable work on the Mineral Resources of the Great Republic, and to the Superintendents and Resident Managers of the principal mines for much useful and freely communicated information.

APPENDIXES.



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APPENDIX II.

PRESENT MINING LAWS OF NOVA SCOTIA.

REVISED STATUTES OF MINES AND MINERALS.

[Passed the 10th day of May, A.D. 1864.]

BE it enacted by the Governor, Council, and Assembly, as follows :

1. The word "mine," in this chapter, shall mean any locality in which any vein, stratum, or natural bed, of coal, or of metallic ore, or rock, shall, or may, be worked. The verb "to mine," in this chapter, shall include any mode or method of working whatsoever, whereby the ore, earth, or soil, or any rock, may be disturbed, removed, washed, sifted, smelted, refined, crushed, or otherwise dealt with, for the purpose of obtaining Gold, Coal, Iron, Copper, or any other other ore, or metallic substance, and whether the same may have been previously disturbed, or not.

2. Gold bearing quartz shall be held to mean all auriferous rock *in situ*.

3. Gold elsewhere than in rock *in situ*, shall mean alluvial mines.

4. The Governor in Council is hereby authorized to select and appoint, when and so often as occasion may require, a suitable person to act as Chief Commissioner of Mines for the Province, and suitable persons to act as Deputy Commissioners of Mines in the several districts, hereinafter provided for, one of whom shall be named Provincial Deputy Commissioner, and to define the limits of their jurisdiction respectively; and by virtue of and during the continuance of such appointment, such Chief Commissioner of Mines within all the Gold Districts, and such Deputies within the districts to which they are respectively appointed, shall exercise the power of Justices of the Peace; pro-

vided always that no such Commissioner shall act as a Justice of the Peace, at any court of general or special sessions, or in any matter out of session except for the administering of affidavits, the preservation of the Peace, the prevention of crimes, the detection and commitment of offenders, and in carrying out the provisions of this Act.

T5. he Governor in Council shall also appoint an Inspector of Mines, who shall be a competent, scientific, practical, coal-mining engineer, whose duty it shall be to visit, from time to time, as may be deemed necessary, and inspect the various mines belonging to, or under lease from, the Crown, to ascertain if the laws, stipulations, and agreements, relative to the working and management of such mines, and to the payment of rents and royalties accruing therefrom, are complied with; and if the same are being worked in a scientific, workmanlike, and effective manner, due regard being had both to maintaining the value of such mines and providing for and protecting the safety of the persons employed therein; and the Inspector of Mines shall, from time to time, report in accordance with the facts to the Government.

6. The Chief Commissioner of Mines and his Deputies, and the Inspector of Mines, shall hold office during pleasure, and shall give bonds for the faithful discharge of their duties in such sums as may be fixed by the Governor in Council. The salary of the Chief Commissioner of Mines shall be two thousand dollars. The salaries of the Deputy Commissioners shall be fixed by the Governor in Council, not to exceed three dollars per day, while actually employed: the salary of the Inspector of Mines shall be fixed by the Governor in Council.

7. The Chief Commissioner, Deputy Commissioners, and Inspector of Mines, shall be incapable of being elected to, or of sitting or voting in, the House of Assembly; and any such Commissioner, Deputy Commissioners, or Inspector of Mines, who shall sit, or vote, as a member, shall forfeit two hundred dollars for every day in which he shall so sit, or vote, to be recovered in the Supreme Court.

8. No Chief Commissioner, Deputy Commissioner, or Inspector

of Mines, shall vote, or take any part, or use any influence, directly or indirectly, in the election of any representative to sit in the Assembly, under a penalty of two hundred dollars for every such offence, to be recovered in the Supreme Court.

9. No Chief Commissioner, Deputy Commissioner, or Inspector of Mines, shall be directly or indirectly interested in any mine or mining operations, or in the proceeds or profits thereof, nor shall he act as the agent, or attorney of any person interested therein, under a penalty of one thousand dollars for every offence, to be recovered in the Supreme Court.

OF GOLD MINES.

10. The Governor in Council, on being satisfied of the discovery of Gold in any locality, may, by proclamation in the "Royal Gazette," declare such a locality to be a Gold District, and assign limits and boundaries to such District, and, from time to time, enlarge, contract; or otherwise alter such limits.

11. Quartz Mines shall, so far as local peculiarities or other circumstances may permit, be in general laid off in areas of one hundred and fifty feet along a quartz lode, by two hundred and fifty feet across, which shall hereinafter be known and described as areas of class *Number one*.

12. Areas shall be laid out, as far as possible, uniformly, and in quadrilateral or rectangular shapes. Measurements of areas shall be horizontal and each area shall be bounded by lines vertical to the horizon.

13. Alluvial mines not under lease at the time of the passing of this Act, and alluvial mines under lease at such time, but which shall hereafter be surrendered by their lessees, or become forfeited to the Crown, shall be laid out, as far as local peculiarities will allow, as directed in case of quartz mines, the courses of the respective boundary lines of such mines to be decided by the Chief Commissioner of Mines; and the advance payments, or rents, and royalties shall be the same as those of quartz mines.

14. The Chief Commissioner of Mines and each Deputy shall be provided with a Book of Record, wherein shall be entered all applications for areas, with the precise time of their being

made, showing the description of area supplied for, the amount paid, the name or names of the applicants in full, with the name of the party paying, which shall be open at all reasonable times, to the inspection of all persons desiring to see the same; and as each applicant shall pay for and file his written application for a mine, the name of the applicant shall be written on the area or areas, applied for; and each Deputy Commissioner shall make a return weekly, or oftener if required, to the Chief Commissioner, of all applications so made, and of the names written on the plan required by the 15th section, and remit the amounts paid.

15. It shall be the duty of each Deputy Commissioner to prepare, when necessary, and keep a plan of the Gold Field, or Fields, within his jurisdiction, with the areas that shall have been laid off, all distinctly marked thereon; and with his weekly, or other Return to the Chief Commissioner, he shall forward a duplicate plan of all surveys made during the week, if any, and the Chief Commissioner shall cause such plan to be forthwith copied upon a general plan to be prepared and kept by him, of the Gold Fields in question.

16. The Deputy Commissioner shall, on receipt of an application, endorse thereon the precise time when received; but no application shall be valid unless made in writing, defining the area applied for, and accompanied (except in case of free claim by discovery, under the provisions of this chapter) by the advance sum hereinafter required to be paid for such area.

17. The advance sum to be paid upon every application made after the passing of this Act, for a Gold mine, shall be at the rate of two dollars for each area of class Number one; but nothing herein contained shall prevent the repayment, out of royalty accruing from the leased premises, of any such advance sum paid in accordance with any former Act of this Province.

18. Applicants for leases of mining areas, in private lands, may arrange, by agreement in writing, with the proprietors for leave to enter, and for easements and for damage to lands; and in such case the agreement shall be deposited with the Chief Commissioner, or Deputy Commissioner for the district, and the

applicant shall thereupon be immediately entitled to his lease, and to enter and mine upon the area applied for.

19. When no agreement shall have been made between the applicant for a mine and the owner of the land (as provided for in the 18th section of this chapter), it shall be lawful for the said applicant to give notice to the owner, tenant, or other persons interested therein, to appoint an arbitrator to act with another arbitrator named by the applicant, in order to award the amount of damages to which the owner, tenant, or other person interested in said land shall be entitled by reason of the opening of a mine thereon; and such notice shall be personally served upon the person or persons, to whom addressed, or left at his, her, or their last place of abode, at least ten days before the expiration of the time therein limited for the appointment of such arbitrator.

20. The arbitrators thus chosen by the applicant, and the owner, tenant, or other person interested in the soil, shall be sworn to the impartial discharge of the duties assigned them; and they shall forthwith proceed to estimate the reasonable damages which the owners and tenants of such land, according to the several interests therein, shall sustain by reason of the opening of necessary shafts, and other excavations, the construction of roads and drains, the erection of necessary works and buildings thereon, and of the occupation of so much thereof, to be determined by the Inspector of Mines in the event of any question arising therefrom, as the applicant may require for all other purposes connected with the opening and working a mine, or mines, to the most advantage, thereon. In estimating such damages, the arbitrators shall value the land irrespectively of any enhancement thereof from the supposed existence of Gold, or other minerals, ores, or metallic substances therein, or in the neighborhood thereof. In case the arbitrators cannot agree, they may select a third arbitrator.

21. When the proprietor is unknown, or cannot be found, or upon notice refuses or declines to appoint an arbitrator, or when, for any other reason, no arbitrator is appointed by the proprietor or proprietors within the time named therefor in the notice

provided for by the last section, the Custos of the County wherein the lands lie shall appoint one on his, or their, behalf ; and when two arbitrators cannot agree upon a third arbitrator, as directed in the last section, the Custos of the County shall select such third arbitrator, who shall be sworn as aforesaid. The award of any two of the three arbitrators, made in writing, shall be final.

22. When it shall be made to appear to the Chief Commissioner of Mines that the applicant has paid the damages awarded against him, to the person or persons entitled to receive the same, he shall be entitled to enter upon the area applied for and to receive a lease thereof as hereinafter directed.

23. When the right shall be in dispute, or the persons entitled be unknown or uncertain, the party liable therefor shall pay the awarded damages to the County treasurer, such payment to the County treasurer to be equivalent to the payment hereinbefore directed.

24. Payment of such damages, by the party liable therefor, to the persons designated by the award as entitled thereto, or if the award shall not designate the persons entitled, to such persons as, in the absence of any dispute, shall be ostensibly entitled thereto, shall exonerate the party making payment ; but any persons subsequently claiming to have been entitled to the damage so paid, may prosecute their claim by action for money had and received against the persons to whom the payment shall have been made.

25. In case of disputed, or unknown title, the Supreme Court or a judge thereof, on application of the claimant, shall order the damages paid to the County treasurer, to be paid to the persons who, on due investigation by such Court or judge, shall have established their right ; but no order shall be made until it shall be shown that notice has been given sufficient, in the judgment of the Court, or judge, to protect the rights of all persons who may be, or who may claim to be, interested.

26. The mining Lessee, or Licensee, shall not be implicated in controversies between persons contesting title to the damages.

27. In no case in which the award shall find the amount of

damages with sufficient certainty, shall such award be set aside, because the persons entitled to damages are not designated by name, or sufficiently designated, or by reason of irregularity as to the persons entitled, or of any matter of form ; but a judge, or the Supreme Court shall rectify any error, or informality, or shall adopt such proceedings as may be necessary for determining to whom the damages may be paid, or for otherwise carrying into effect the provisions and intent of this charter.

28. The parties obtaining licenses and leases under this chapter and those deriving title under them, shall be answerable for damages that may ensue from the falling in of land, or for other injury which may be sustained by the owners, or tenants, of such lands subsequent to the agreement for, or award of, damages required by the foregoing sections, by reason of the works of the parties obtaining licenses or leases, or of those under them, or deriving title from or through them.

29. All leases shall be for the term of twenty-one years ; but the holder of any such lease, may at any time, surrender the same by notice in writing signed by him and filed in the office of the Chief Commissioner of Mines ; but nothing herein contained shall be construed to discharge him from liability in respect of any covenants in the lease, for or in respect of any act, matter, or thing for which, at the date of such surrender, he was liable under the terms of such lease.

30. Such leases may be forfeited on failure to pay the stipulated royalties other than those arising from quartz crushed at a licensed mill, or to keep employed annually on the demised premises the number of days' labor hereinafter specified, or to comply with any other of the provisions and stipulations in the lease contained.

31. The holder of such mining lease shall not use any part of the lands so demised for any other purpose whatsoever, except such as shall be necessary for making roads, opening drains, erecting necessary works, buildings, and all other purposes connected with the opening and working such mines to the most advantage ; and all necessary ways and watercourses over the demised premises, whether expressly reserved in such lease, or

not, shall be considered as reserved to the Crown, and in respect to the making, alteration, and use thereof, shall be subject to such orders and regulations as the Governor in Council may, from time to time, consider expedient; and all Licensees and Lessees and other persons employed about the mines on such demised premises shall use the lands in such manner as will be least injurious to the owners and occupants of such lands, or any other lands lying contiguous thereto.

32. There shall be employed annually on the demised premises a number of days' labor equivalent to one hundred days for every Number One area comprised therein. But any lessee holding ten or more, but less than twenty, areas of class Number One in any Gold District, will not be required, during the *first* year of his holding, to keep employed more than three-fourths of the number of days' labor above required to be performed per area; in like manner, if holding twenty or more, but less than thirty, of such areas in the same district, he shall be required to keep employed only one-half; and if holding thirty or more, only one fourth the above required number of days' labor, during such first year. This section shall apply to all leases the first year whereof terminated on, or after, the first day of April, A.D. 1864.

33. In computing the number of days' labor employed by any lessee, at the termination of any one year, all or any of the leases which he at the time holds of mining areas in any one District, not exceeding twenty-four in number, may, for this purpose be tacked and considered as one lease; and if it is ascertained that an amount of labor equal to the whole amount which he is required to have performed upon the whole of the said areas, has been actually expended upon any one or more of said areas, the law in this respect will be held to have been complied with, although the lessee may not have employed upon each separate mining area the number of days' labor required by the last preceding section. This section shall apply to all leases the first year whereof terminated on, or after, the first day of April, A.D. 1864.

34. Where a lessee shall have employed in any one year a part

only of the amount of labor required to be performed by him annually upon the premises demised to him in any one District, or under any one lease, the whole of the areas held by him in such District, or under such lease, shall not necessarily become forfeited therefor, but only a part of such demised premises proportionate to the number of days' labor which such lessee has failed to have performed, shall become forfeited; and such lessee shall make selection of that part of the demised premises which he will retain. To avail himself of the provisions of this section, a lessee must make known his selection by notice in writing to the Chief Commissioner of Mines within ten days after the termination of the year for the non-performance of labor during which a portion of the premises demised to him become forfeited; and the areas selected by him to be retained shall, so far as possible, be in a compact block and not detached from each other, and no Number One area shall be divided in making such selection. Should any one lease contain areas thus retained and also areas which are forfeited, such lease shall be surrendered by the lessee who shall receive a new lease of the areas so retained, and for the unexpired portion of the term for which the surrendered lease had been given. Provided that on obtaining such new lease, and by the same, the lessee shall be required in addition to the work to be done thereunder, to do the work unperformed by him under the surrendered lease.

35. When, from any cause whatever, a leased mine shall become forfeited to the Crown, under the proceedings directed by the 73rd clause of this Chapter, all the right, title, and interest which the holder of such forfeited lease had therein immediately previous to such forfeiture shall, upon such forfeiture, become thereby vested in the Crown; but the lessee of any mine may, during his lawful occupancy thereof, take down and remove any houses, buildings, machines, or other erections built or placed by him thereon, notwithstanding that the same be considered in law as attached to the freehold.

36. Applications may be made for a mine or mines, upon lands not lying within any proclaimed Gold District; and in such case the rights of parties and the proceedings to be taken with refer-

ence thereto, shall be governed, as far as possible, by the spirit and provisions of this chapter. Parties occupying and staking off areas corresponding in size with those prescribed hereby, shall be entitled to priority in the order of their making application, as hereinbefore required, to the Chief Commissioner of Mines. In case the lands so applied for shall afterwards be included within any Gold District, and laid off as hereinbefore prescribed, the rights of the occupants shall be respected so far as is consistent with the terms of this chapter, on adjusting the boundary lines between the parties in occupation.

37. In all cases where mining areas have, previous to the first day of April, 1864, been leased, or have been occupied by virtue of a Gold Commissioner's authority, on private lands not subsequently revested in the Crown, and with respect to which no agreement has been made, nor was on the said first day of April being negotiated, for land damages between the lessee and the owner of the soil, the Chief Commissioner of Mines shall proceed to arrange with the owners of the soil for such damages, by mutual agreement, or arbitration, and to pay such damages, in the manner and form prescribed by the 18th and subsequent sections of this chapter, for applicants for mining leases; and in such cases the Chief Commissioner of Mines shall occupy, so far as circumstances will permit, the same position relative to the owners of the soil which, under the clauses above referred to, would be held by an applicant for a mining lease on private lands whose application is made after the passing of this Act.

38. The Chief Commissioner of Mines may issue licenses to search for Gold, to be called "Prospecting Licenses," which shall be subject to the rules prescribed by this Act.

39. Such Licenses may include any area not exceeding one hundred acres in extent, so as the same shall be laid off in quadrilateral and rectangular figures, and shall not in length exceed double the breadth thereof.

40. Such Licenses shall be in force for any period not exceeding three months from the date thereof.

41. All applications for Prospecting Licenses shall accurately define by metes and bounds the lands applied for, and shall be

accompanied by a payment at the rate of fifty cents per acre for every acre up to ten acres in extent, and twenty-five cents for every acre in addition to that extent.

42. Before such application shall be granted the applicant shall enter into a bond with two sureties to the satisfaction of the Commissioners of Mines, to recompense the proprietor of the soil, in the event of entry being made on private lands, for damages done to his lands; to employ and lay out during the continuance of the License, in prospecting the lands applied for, labor to the extent of one man per day for every lot not exceeding five acres in extent, and for any quantity above five acres at the rate of one additional half day for every additional quantity not exceeding ten acres; and to make the quarterly returns and to pay the royalties hereinafter required.

43. If the proprietor of private lands so entered upon shall seek damages, he shall, before the end of three months after the expiration of the license, make his claim in writing against the holder of said license, detailing the particulars and amount of claim; and if the claim is not adjusted by agreement between the parties within one month after notice thereof as aforesaid, it may be settled by arbitration in accordance with the provisions of section 18 and subsequent sections of this chapter; but in such case either of the parties may give the required notice to appoint an arbitrator, and the Custos of the County may appoint an arbitrator on behalf of either of such parties neglecting, or refusing, to make such appointment.

44. The holder of a Prospecting License who shall have fulfilled all the terms and conditions thereof, shall be entitled to a renewal thereof for a second period of three months, upon like terms and conditions, except that the price of the same place shall be only half that paid on the previous application.

45. Within the period for which the License, or renewed License, is granted, the party holding the same shall be entitled to select any area or areas, not exceeding one quarter of a mile on the lode and in breadth five hundred feet, comprised therein in form as described in this Chapter, and shall be entitled to a lease of the areas selected upon the terms imposed herein.

46. No Lease, nor any Prospecting License, shall authorize entry upon any buildings, or the curtilage appertaining to any house, store, barn, or building, or upon any garden, orchard, or grounds, reserved for ornament, or under cultivation by growing crops and enclosed, except with the consent of the occupier, or by special license from the Governor in Council, authorizing such entry, to be granted on special application setting forth the circumstances under which the same is applied for, and on such terms as the case may require.

47. On all leases, of Gold Mines, and Prospecting Licences to search for Gold, there shall be reserved a royalty of three per cent. upon the gross amount of Gold mined.

48. The discoverer of any new mine shall be entitled to a lease for twenty-one years, free from advance payment, or royalty, of an area of class Number One as prescribed by this Chapter.

49. No person shall be considered the discoverer of a new quartz mine unless the place of the alleged discovery shall be distant, if on a known lode, at least three miles from the nearest known mine on the same lode, and if not on a known lode at least one mile at right angles from the course of the lode; if in alluvial workings, at least two miles distant from any previously discovered mine.

50. It shall not be lawful for any person or persons to use or employ any mill or machinery (other than mills or machinery worked by hand), for the crushing or reduction of quartz, or the obtaining of the gold therefrom by crushing, stamping, amalgamating, or otherwise, without a license therefore first had and obtained.

51. Such licenses shall be signed by the Chief Commissioner of Mines.

52. The words "Licensed Mills," when used in this chapter shall signify mills and machinery so licensed, and the words "Licensed Mill Owner," the person or persons to whom such license shall be granted.

53. Before any such license shall be granted the party applying therefor shall enter into a bond to Her Majesty in the penalty of two thousand dollars.

54. Licensed mill owners shall keep on the demised premises a book or books of account to be supplied by the Commissioner of Mines, which shall at all times be open to the inspection and examination of the Commissioner of Mines or his Deputy, or the Inspector of Mines, or any other person thereto authorized by the Commissioner of Mines; in which book or books shall be entered a clear and distinct statement of all quartz crushed, amalgamated, or reduced at such licensed mill, and the following particulars in respect of the same :

I. The name of the owner or owners of each distinct parcel or lot of quartz crushed.

II. The weight of each such parcel or lot.

III. The date of the crushing of the same.

IV. The actual yield in weight of gold from each such parcel or lot.

V. The royalty thereon calculated at three per cent.

VI. The mine or area (so far as the same is known or can be ascertained) from which each such parcel or lot was raised.

55. Each licensed mill owner shall separate from the yield or produce of gold of each lot or parcel of quartz as crushed three parts out of every hundred parts of such yield as the portion thereto belonging and payable to Her Majesty as royalty, and shall pay the same in such weekly or other payments as the Chief Commissioner of Mines shall order, into the office of the Chief Commissioner of Mines or his deputy for the district, or otherwise shall pay as aforesaid the equivalent in money for the same, at the rate of nineteen dollars and fifty cents per ounce troy for smelted gold, and eighteen dollars and fifty cents per ounce troy for unsmelted gold.

56. So soon as gold shall be obtained by amalgamation, or otherwise, from any parcel or lot of quartz crushed at any licensed mill, three parts in the hundred of such gold shall forthwith thereafter be and become the property of Her Majesty.

57. In case any licensed mill owner shall fail to pay such three parts on the hundred of gold, or money in lieu thereof, in the mode and at the times prescribed by this chapter, he shall be liable to an action at the suit of the Commissioner of Mines, a

for money had and received to his use, for the value of said gold, estimated at nineteen dollars per ounce troy.

58. Such action may be brought according to the amount of the claim before the same courts which would have jurisdiction in case the amount claimed were an ordinary private debt.

59. Each payment of gold or money made by a licensed mill owner shall be accompanied by a copy of so much of his said book of account as shall be required to show the particulars prescribed by the fifty-fourth section thereof, which shall be verified by the affidavit of the person principally employed in keeping such account made before the Commissioner of Mines or his deputy, or before a Justice of the Peace; and on failure to make such returns or to verify the same as aforesaid, the license may be revoked by the Commissioner of Mines, subject to appeal as prescribed in section sixty-two of this chapter.

60. Any owner or part owner in any mill or machinery for the crushing or reduction of quartz or for the obtaining of gold therefrom (other than mills or machinery worked by hand) which shall be engaged, used or employed in the crushing or reduction of quartz, or in the obtaining of gold therefrom, without a license therefor first had and obtained as prescribed by this chapter, and any person or persons engaged as agent, servant, workman, clerk, or otherwise in any such mill, shall forfeit and pay each the sum of four hundred dollars for each offence, and for every day in which such offence shall be committed the same shall be considered a new offence.

61. When the account books prescribed by this chapter, or any of the accounts hereby required, shall be fraudulently or falsely kept, or the affidavits hereby prescribed, or any of them, shall be false or fraudulent, the license to the mill in respect of which the offence has been committed may be revoked.

62. The Chief Commissioner of Mines shall be authorized to inquire into any such alleged fraud, and to revoke such license if satisfied that such fraud has been committed, but his judgment shall be subject on appeal to the revision of a judge at chambers who shall make such order in respect of the same as shall be

agreeable to law and justice, and if he thinks fit may order any question of fact to be tried by a jury.

63. In addition to the forfeiture of license, any licensed mill owner in respect of whose licensed mill such fraud shall have been committed, shall be liable for each offence to a penalty of not more than two thousand dollars, to be recovered in the Supreme Court.

64. Every licensed mill owner who shall in all respects have complied with this chapter shall be entitled to receive from the Chief Commissioner of Mines at the end, or expiration, of every three months from the date of his license a sum equal to five per cent. upon the amount paid over by him as royalty during such period.

65. A licensed mill owner may at any time surrender his license by delivering the same into the office of the Commissioner of Mines, with a written surrender endorsed thereon, but no such surrender shall take effect till after the lapse of ten days from the filing at the office of the Chief Commissioner of Mines, of a notice in writing of the intention of such mill owner to surrender the same.

66. Upon such a surrender taking effect as aforesaid, such mill shall cease to be a "licensed mill" until again licensed under the provisions of this chapter.

67. The licensed mill owner so surrendering his license and his sureties shall remain liable under their bond for all obligations accruing thereunder up to the time when the surrender takes effect, as aforesaid, but shall not be liable for obligations accruing thereafter.

68. Lessees of mines shall be bound to make to the office of the Chief Commissioner of Mines, or his deputy for the district, on the first day of January, April, July, and October in each year, a true and correct return to the best of their knowledge and belief, on forms to be supplied by the Chief Commissioner of Mines, in which shall be comprised the following particulars:

I. The number of days' labor performed on the demised premises during the preceding quarter,

II. The number of tons of quartz raised from the demised premises during the preceding quarter.

III. The person, or persons, to whom the same has been sold, or disposed of, and the different lots, or parcels, in which the same have been sold, or disposed of, with dates.

IV. The weight of quartz sent by him during the quarter to any licensed mill, and the name and description of the mill to which the same has been sent; and when the same has been sent and kept in distinct parcels, the weight of each separate parcel.

V. The yield of each separate parcel, or lot, as returned and allotted by the mill owner, with the date of allotment and of receipt.

VI. The quantity of all gold obtained from the mine in any manner during the quarter, distinguishing that resulting from the quartz crushed at licensed mills from the gold otherwise obtained; which return shall be verified by affidavits to be made before the Commissioner of Mines, or one of his Deputies, or a Justice of the Peace.

69. The lessee of each mine shall be liable for royalty upon all gold obtained from his mine in any other way than from quartz crushed by licensed mills; but he shall be exempted from any claim in respect of gold obtained from quartz so crushed, the liability of the mill owner for such royalty being hereby substituted instead of that of the lessee.

70. When any parcel of quartz from a free mine shall have been crushed at a licensed mill the owner of the quartz on proof of the facts to the satisfaction of the Commissioner of Mines, shall be entitled to receive from the Chief Commissioner of Mines, the amount deducted by the licensed mill owner and paid as royalty under the provisions of this chapter.

71. In case any holder of a lease granted under this Chapter shall fail to make payment of any royalty accruing under the terms of the sixty-ninth section within ten days after the time prescribed by this Chapter for making his return to the Chief Commissioner of Mines, or his Deputy, he shall be liable to an action at the suit of the Commissioner of Mines, as for money

had and received to his use for the value of the royalty so accruing, estimating the same at nineteen dollars per ounce troy.

72. Such action may be brought according to the amount claimed before the same court, which would have jurisdiction in case the amount claimed were an ordinary private debt; and on a change of Commissioner of Mines, actions prosecuted by him shall be continued and prosecuted by and in the name of his successor; and a Commissioner may prosecute in his own name, as for money had and received to his use, although the action for the same had accrued to a previous Commissioner.

73. In any case of alleged forfeiture of any mining lease, for non-compliance by the lessee with the terms, stipulations, and conditions therein contained, or by this chapter required, the Deputy Commissioner for the District, or if the leased premises are not within a proclaimed Gold District, or are in a Gold District where there is no Deputy Commissioner, then the Chief Commissioners of Mines shall investigate the said case and decide in a summary way thereon; and when such decision declares the Lease in question to be forfeited, the Chief Commissioner, or Deputy Commissioner, so deciding, shall immediately thereafter have a notice personally served upon such lessee, or some or one of them where more than one are included in the same lease, or his or their agent, or person principally employed on the premises, if to be found within the Gold District, and if not, such notice shall be posted up upon the leased premises, which notice shall convey the decision of the Commissioner, and briefly state the grounds thereof. The Deputy Commissioner shall also, in all such cases, report his decision to the Chief Commissioner with a statement of the facts upon which the same is founded.

74. If, within ten days after the service, or of the posting up such notice, the lessee or lessees, against whom the decision was made, or any person acting on his or their behalf, give notice to the Chief Commissioner of Mines that he is aggrieved at the decision of the Deputy Commissioner and appeal against it, the Chief Commissioner shall appoint a time and place for hearing

such appeal, of which such lessee or lessees shall have reasonable and timely notice; and at such time and place, the Chief Commissioner shall proceed to investigate the case anew and decide upon the whole facts thereof.

75. From the judgment of the Chief Commissioner of Mines, either in the first instance, or on appeal, the party interested may appeal to a judge at chambers, provided that notice of such appeal be given to the Chief Commissioner of Mines within ten days from the date of his decision; provided also that the party appealing shall on applying for such appeal make and file with the Chief Commissioner of Mines an affidavit that he is dissatisfied with such judgment, and that he verily believes the lease has not been forfeited, and that the conditions in respect of which the forfeiture has been declared have really and truly been performed and fulfilled, and shall within two days thereafter, enter into a bond with two sufficient sureties in the penalty of fifty dollars, to enter and prosecute his appeal according to the provisions hereof, and pay all costs, which may be adjudged against him by the Court of Appeal.

76. On such appeal being perfected the Chief Commissioner of Mines shall transmit to the prothonotary at Halifax the notes of testimony taken before him, and the judge at chambers shall confirm, or set aside, the judgment, or try the case *de novo*, or make such order thereon as is agreeable to justice and in conformity with law.

77. If the judge shall consider that the case involves questions of controverted fact on which he may be of opinion the verdict of a jury should pass, he may make an order remitting the trial of the question, or questions, of fact to the county where the land lies, in which case all the papers shall be transmitted to the prothonotary of that county; and the cause shall come on for trial in its place in the same way as ordinary appeals ordered to be tried by a jury.

78. Upon the finding of the jury on the facts the judge shall pronounce judgment on the whole case. So soon as judgment declaring forfeiture of the lease shall be given, either by a Deputy Commissioner without appeal, the Chief Commissioner

without appeal, or by the court of appeal when the Commissioner's judgment is appealed from, the lessee and all persons holding under him shall thereafter cease to have any interest in the mine leased, and the same shall be open to be leased to any other applicant in the same way as if no lease thereof had ever passed; and pending the proceedings between the delivery of the first judgment and any subsequent judgment on appeal therefrom, such lessee shall suspend all mining operations on the area alleged to be forfeited, otherwise he may at the discretion of the Commissioner, be liable to be treated as a trespasser as hereinafter directed.

79. The Chief Commissioner of Mines shall have power by warrant to the Sheriff or any constable of the county wherein the Gold District lies, to remove any party in possession of a mine so adjudged to be forfeited.

80. Any person found mining in any lands belonging to the Crown, or on any land of a private proprietor, the minerals in which belong to the Crown, or entering thereon for the purpose of mining, shall be liable to a penalty for each offence of not less than ten dollars nor more than fifty dollars; but this section shall not extend to parties prospecting, or searching for mines.

81. Parties violating the provisions of the preceding section, shall be considered guilty of a distinct offence for every day they shall unlawfully mine.

82. On complaint in writing made to any Justice of the Peace of the County in respect of such unlawful mining, or entry to mine, the Justice shall issue his warrant to apprehend the offender and bring him before the Justice to answer the complaint; such Justice shall thereupon forthwith enter upon the investigation of the complaint, and in case he shall find the party guilty, impose such fines, or penalties, as the party may have incurred under the provisions of this chapter. In case the defendant requires time for the production of witnesses for the defence, the Justice may adjourn the investigation to any period not exceeding six days, on being satisfied by affidavit that such time is required for that purpose, and in such case the defendant shall be

committed to gaol unless he gives security to the satisfaction of the Justice to appear at the time and place appointed for such adjourned investigation.

83. The decision of such Justice shall be subject to appeal, as in ordinary cases, but before such appeal shall be allowed, the appellant shall give bonds to render him in custody of the Sheriff, to pay the costs of the appeal, in case of a decision against him, and in case of the defendant appealing, as the Court of Appeal may impose, with costs.

84. Gold in quartz or otherwise, unlawfully mined on the property of any lessee of the Crown, shall be considered in law the personal property of the owner of the mine, and a search warrant may be issued for the same by any Justice of the Peace for the county, in the same manner as for stolen goods; and, upon the recovery of any gold under such warrant, the Justice shall make such order for the restoration thereof to the proper owner, as he shall consider right.

85. Nothing in this chapter contained shall prevent Her Majesty from having or using any other remedy now available to recover possession of any mine forfeited from causes cognizable before the Chief Commissioner of Mines, or from any other cause from which the same may be liable to forfeiture.

OF MINES OTHER THAN GOLD MINES.

86. The Chief Commissioner of Mines may upon application grant licenses to be in force for one year from the date of application therefor, to enter upon any lands in this Province, not already under license or lease for mining purposes, and to dig and explore for such minerals other than Gold as the Crown holds for the benefit of the Province; a bond being first given to the Chief Commissioner of Mines with sufficient sureties to be approved by the Governor in Council, that in the event of entry being made upon private lands, recompense shall be made for damages in the manner hereinafter provided.

87. No such application shall be valid unless accompanied by a payment of twenty dollars; and the license of exploration

may cover any single tract of ground not exceeding five square miles in extent, but not less than two miles in width.

88. Upon such application and payment being made, the Chief Commissioner of Mines shall cause the lands applied for to be surveyed and laid off, and a full description thereof shall be embodied in the license of exploration, but no such license shall authorize entry upon any lands which in accordance with the 46th section of this chapter, are forbidden to be included in any Gold Mining Lease, or Prospecting License, except as in that section excepted.

89. The cost of such survey shall be defrayed by the Chief Commissioner of Mines, but the search for minerals under such licenses shall be made free of all expense to the Government, and the holder of the license shall within the time that the same shall be in force, and with all convenient speed, make a report of the result of his explorations to the Chief Commissioner of Mines.

90. The said license of exploration may be renewed for a further period of twelve months, on application therefor to the Chief Commissioner of mines, setting forth the special circumstances of the case, not less than thirty days before the expiration thereof, and on payment of the further sum of twenty dollars, subject, however, to the approval of the Governor in Council, upon consideration of the special circumstances submitted.

91. If the proprietor of private lands entered under such license shall seek damages, the proceedings for ascertaining the amount of such damages, and making payment of the same, shall be the same as provided for by this chapter in the case of Prospecting Licenses for Gold.

92. The holder of an exploration license may at any time before the expiration thereof, select from the land covered by such license, an area of one square mile, for the purpose of working the mines and minerals thereon; and may make an application in writing to the Chief Commissioner of Mines for a license to work the same, which application shall be accompanied by a payment of fifty dollars.

93. Upon such application and payment being made, the Chief

Commissioner of Mines shall cause the portion so selected to be surveyed and laid off, and shall defray the expense of such survey, which said portion shall be in one block, the length of which shall not exceed two and a half miles; and the person making such survey shall make a report and plan thereof, and transmit the same to the Chief Commissioner of Mines.

94. All the provisions herein contained relative to settlement by agreement, or arbitration, with the owner of the soil, where the same is private land, for damages done to his land, and to payment therefor as set forth in section 18 to 28 inclusive, and to the occupation of such lands as declared in section 31, and to the exemption of certain descriptions thereof from liability to be leased, as specified in section 46, and to the vesting of interests forfeited under this chapter as specified in section 35, shall be applicable and in force in the case of mines other than Gold mines, equally as in Gold mines.

95. Upon complying with the requirements of this chapter by paying damages where the applied ground for is private land, the applicant shall be entitled to a license to occupy and work the one square mile applied for.

96. Every license to occupy and work shall be for a term of two years from the date of application, and within such term the holder of the license shall commence effective mining operations, and shall continue the same in good faith until the termination of such term.

97. The holder of a license to occupy and work, or those representing him, having complied with the terms of the last preceding section, shall on the determination of his license be entitled to a lease of the premises described therein, which lease shall contain all the ordinary provisions of mining leases, with such conditions as the Governor in Council may think necessary to ensure the effective and safe working of the mine or mines on said premises.

98. Any party may apply for a license to occupy and work any vacant mine, without having previously obtained or applied for an exploration license, and in such case his application shall embody a description of the area applied for, and upon comply-

ing with all the antecedent conditions hereinbefore set forth, except those which relate solely to exploration licenses, he shall be entitled to such license to occupy and work.

99. The Governor in Council may by special order authorize the granting a lease, or license, to occupy and work a larger area than one square mile, if on investigation of the special circumstances of the case they may think the public interests would be better subserved thereby, and in such case may impose such further conditions, not at variance with the spirit of this chapter, as may be deemed just.

100. All leases of Coal mines shall terminate on or before the 25th day of August, A.D. 1886; leases of mines other than coal mines shall be for twenty-one years; any lease may at any time be surrendered by the lessee in like manner, and upon such terms, as hereinbefore prescribed for the surrender of a Gold mining lease.

101. In the granting of licenses, or leases, after the passing of this Act, there shall be reserved a space of twenty yards in width, between the lines of the respective grantees; but on the application of both parties interested, the Governor in Council may by special order direct a license, or lease, of such reservation to be granted on such terms and in such manner as may be just and reasonable.

102. All licenses and leases of mines and minerals other than Gold mines, shall be subject to the following Royalties to the Crown, to the use of the Province on the produce thereof, after it has been brought into marketable condition, payable yearly from the period of their respective dates, that is to say—of five per cent. on all such ores and minerals, except Gold, Iron, and Coal—of eight cents on every ton of Iron, and of ten cents on every ton of 2,240 lbs. of Coal, which said Royalties shall be paid to such person, or persons, at such times and in such places as the licenses, or leases, shall respectively stipulate, or as the Governor in Council may from time to time direct.

103. Every licensee, or lessee, of mines or minerals, other than Gold mines, shall on the first day of January in each and every year, make a return showing the number of days' labor

performed on the premises under license or lease, the cost and description of the shafts, adits, levels, drains, and other works, and machinery constructed, excavated, or erected thereon ; the description and quantity of the material extracted from the mine, or mines, thereon, and subject to Royalty, and the amount of Royalty which has accrued upon such material extracted during the last previous year. Such return shall be sworn to by two or more credible persons, principally employed in, or about, the working and management of such mines, before the Chief Commissioner, or Provincial Deputy Commissioner of Mines, or a Justice of the Peace, and shall be immediately transmitted to the Chief Commissioner of Mines.

104. Where it shall be represented to, or shall come to the knowledge of, the Chief Commissioner of Mines, that any mines or minerals claimed under a lease from the Crown, or under a lease granted pursuant to this chapter, have been abandoned for the space of one year, have not been effectively and continuously worked, or have been worked only colorably, or to prevent a forfeiture under the terms of such lease, or that the lessee of such mines has failed to comply with any of the terms, covenants, or stipulations in his lease contained, or by this chapter required, or is acting in violation thereof, the Chief Commissioner of Mines shall cause a notice to be personally served upon the lessee, or some, or one of them, where more than one of them are included in the same lease, or his or their agent, or person principally employed on the premises, or shall cause such notice to be posted up upon the premises leased, where no person can be found to make service thereof, informing him of such charge and appointing a time, to be not less than fourteen days after the service or posting up of such notice, and also a place, for the investigation thereof. At the time and place appointed, the Chief Commissioner of Mines shall proceed to investigate the said case, and decide thereon, and shall thereupon give notice of his decision to the lessee, or his agent, by causing such notice to be served, or posted up, as in this section above directed.

105. From the judgment of the Chief Commissioner of Mines

the party interested may appeal to a Judge at Chambers, in which case the proceedings, until final judgment, shall be the same in every particular as are in this chapter provided for in the case of an appeal against the judgment of the Chief Commissioner relative to an alleged forfeiture of a Gold mining lease.

106. There shall be kept in the office of the Chief Commissioner of Mines, a Map of the Province, on which shall be delineated, as accurately as may be, all the areas under license, or lease, as mines other than Gold Mines; and also a book, or Books of Registry, in which shall be registered all the licenses and leases of such monies; and such map and book, or books, shall be open to the inspection of the public.

MISCELLANEOUS.

107. The Chief Commissioner of Mines may lease Crown lands, being within the limits of any proclaimed Gold District, or comprising any tract within which the mines and minerals other than Gold are under license, or lease, for purposes other than mining, reserving always the rights of present, or future, lessees of mining areas therein, and subject to such other reservations, and for such terms, and upon such conditions as the Governor in Council may direct, and may also sell any timber not previously disposed of, growing or being upon any part of the Crown domain, included within any such Gold district, or other tract, under license, or lease, for mines, or minerals, other than Gold, upon such terms as the Governor in Council shall authorize and direct.

108. No lease granted under the provisions of this chapter shall be void against any subsequent purchaser, mortgagee for valuable consideration, or judgment creditor, by reason of such lease not having been previously registered in accordance with the provisions of Chapter 117 of the Revised Statutes, "Of the Registry of Deeds and Incumbrances affecting Lands."

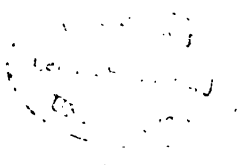
109. The Governor in Council may at any time by proclamation as in this chapter provided, declare a Gold District which

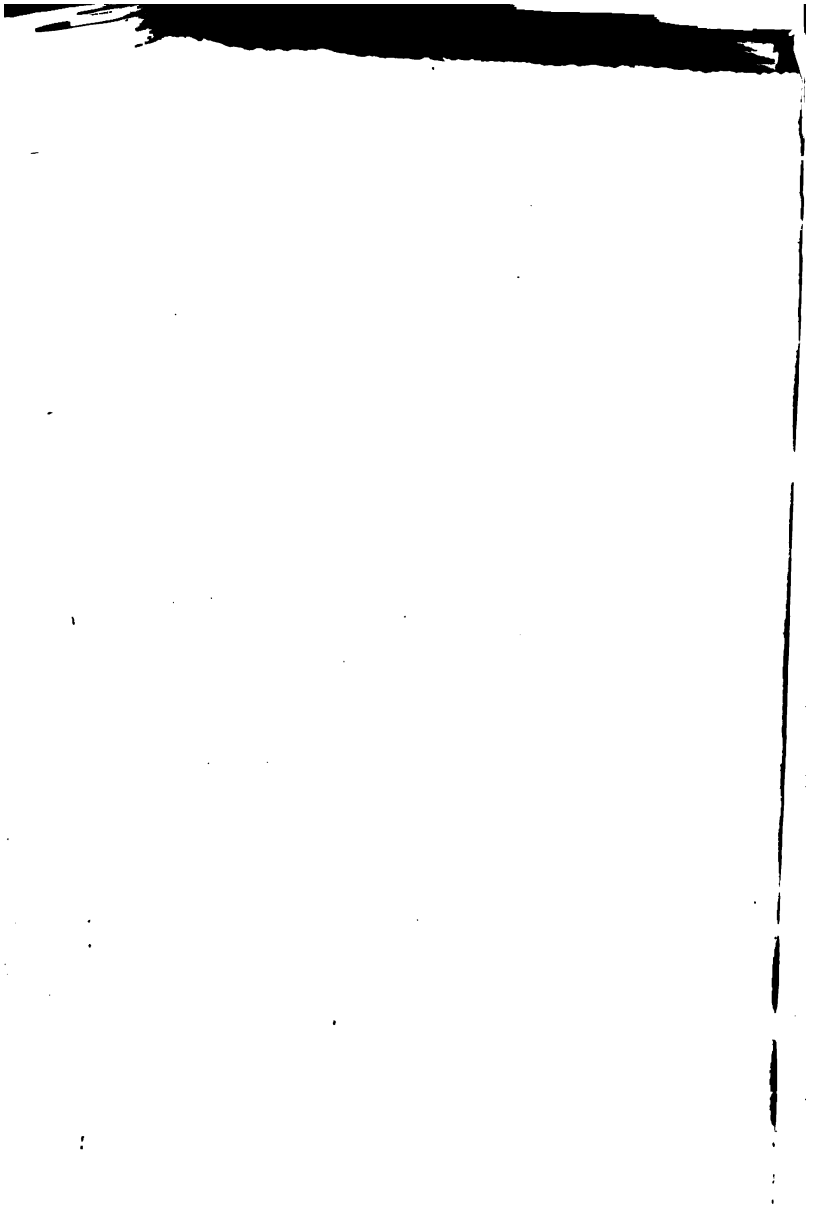
shall contain an area or areas under license, or lease, for the purpose of searching for, or working, mines and minerals other than Gold; and in such case the areas under such license, or lease, shall notwithstanding such license, or lease, become subject to all the provisions of this chapter, which relate specially to Gold Districts and Gold Mines, under such regulations as the Governor in Council shall make.

110. The Governor in Council is authorized to make rules and regulations relative to Gold Districts and Gold mines, and mines other than Gold mines, and licensing and leasing the same, and to the pumping, draining, ventilation, working, management, care, possession, and disposal of the same, and to all other matters connected with the same; and to make such rules and regulations general, or applicable only to particular districts or localities, as may be deemed best; and all such rules and regulations when published in the Royal Gazette, shall have the force of law until repealed by the legislature; provided such rules and regulations shall not be repugnant to the laws of the Province, or the provisions of this chapter; and such rules and regulations may in like manner be altered, modified, or cancelled, as circumstances shall require.

111. The forms to be used under this chapter shall be substantially the same as those heretofore in use, subject, however, to such amendments and alterations as the Governor in Council may, from time to time, make or direct.

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Artists' Colormen

NAME.	STREET.
Wetmore, R. & J. - - - - -	104 Granville.

Attornies and Notaries Public

Gray, B. G. - - - - -	54 Bedford Row.
Thompson, J. S. D. - - - - -	12 Bedford Row.

Apothecaries

Eagar, Martin F. - - - - -	151 Hollis.
Woolrich, John H. - - - - -	114 Upper Water.
Brown, Brothers & Co. - - - - -	143 Granville.

Assayer

Fraser, R. G. - - - - -	72 Granville.
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Auctioneers

Nash, J. D., & Co., - - - - -	127 Hollis.
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Bankers

Huse & Lowell - - - - -	61 Upper Water.
Nova Scotia - - - - -	164 Hollis.
British North America - - - - -	Hollis.
Halifax Banking Co. - - - - -	55 Upper Water.

Boarding Houses

Lovett, Elizabeth - - - - -	68 Hollis.
Cochran, B. W. - - - - -	57 Argyle.

Booksellers and Stationers

Buckley, M. A. - - - - -	85 Granville.
Hall, Z. S. - - - - -	Hollis, opposite Club.
Mackinlay, A. & W. - - - - -	128 Granville.
Gossip, Wm. - - - - -	109 Granville.
Katzman, Mary J. - - - - -	70 Granville.

Boiler Maker

McKay, Adam - - - - -	23 Grafton.
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Boot Maker

Yates, George S. - - - - -	22 and 23 George.
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Bookbinders

Phillips, W. & G. - - - - -	176 Argyle.
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Cabinet Makers

Gordon & Keith - - - - -	36 Barrington.
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Chemist (Analytical)

Fraser, R. G. - - - - -	72 Granville.
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Gold Brokers

Huse & Lowell - - - - -	61 Upper Water.
Fraser, R. G. - - - - -	72 Granville.

Hotels

Halifax - - - - -	108 and 105 Hollis.
International - - - - -	119 Hollis.
Waverley - - - - -	8 Barrington.
Mansion House - - - - -	149 Barrington.
Cosmopolitan - - - - -	7 Bedford Row.

Jewellers and Refiners

NAME.	STREET.
Spike, E. L. & T.	185 Granville.
McCulloch, John M.	83 Granville.
Newman, W. H.	90 Granville.

Livery Stable Keeper

Lavers, Thomas H.	19 and 21 Hollis.
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Mining Implements

Fuller, H. H. & Co.	45 Upper Water.
Starr, David & Sons	Hollis, corner of Duke.
Stairs, Son & Morrow	4 George.

Mining Intelligence

Mines Department	Province Building.
International Mining Agency }	Somerset House, Prince.
Mining Gazette Office	

Newspaper Dealers

Hall, Z. S.	Opposite Club House.
Morton, G. E., & Co.	185 Hollis.
Buckley, M. A.	85 Granville.
Katzman, Mary J.	70 Granville.

Newspaper Offices

<i>Chronicle, Morning</i>	11 Prince.
<i>Citizen</i>	City Buildings.
<i>Colonist</i>	33 Bedford Row.
<i>Express, Evening</i>	32 Bedford Row.
<i>Recorder, Acadian</i>	14 Buckingham.
<i>Saturday Mail</i>	85 Granville.
<i>Reporter</i>	Bedford Row.
<i>Unionist</i>	165 Hollis.
<i>Nova Scotian</i>	11 Prince.
<i>Sun & Advertiser</i>	81 Granville.
<i>Mining Gazette</i>	Somerset House, Prince.

Outfitters

Cabot, J. E.	131 Granville.
Elliot, J. B., & Co.	135 Granville.

Printers

Bowes, James, & Sons	Victoria Buildings.
Blackader Brothers	Recorder Office.

Quartz Mill Manufacturers

Montgomery, W., & Co.	Pleasant.
Symonds, W. S., & Co.	19 and 21 Duke.

Upholsterers

Gordon & Keith	86 Barrington.
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Wine Merchants

Scott, James	158 and 160 Granville.
McLeod, Alex., & Co.	672 Hollis.

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Halifax, N.S., 21st Nov., 1867.



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